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Knowledge Spillovers, Innovation Capability and Innovation Performance:

Evidence from Local SMEs in China

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Abstract: Using empirical data drawn from a field survey of local small and medium-sized enterprises (SMEs) in Guangdong China, this paper explores the effect of innovation capability in the relationship between knowledge spillover effect and innovation performance. The knowledge spillover effect is divided into FDI spillover effect, local business spillover effect, and local institute spillover effect. The innovation capability consists of two different abilities of knowledge transfer capability and knowledge production capability. According to the empirical data drawn from a field survey of SMEs operating in China, we made conclusions through hierarchical regression analysis. Firstly, three knowledge spillover effects have the significant impact on the innovation performance. Secondly, knowledge production capability has the significant moderate effect on the relationship between three knowledge spillover effects and innovation performance. Thirdly, the moderating effect of knowledge transfer capability on the relationship between FDI spillover effect and innovation performance is significant.



1. Introduction

Recently, the external environment that local enterprises embedded in has changed a lot. Global competition, diversification of consumer demand, technological innovations and leap ever-shortening product life cycle have had a great impact on the performance of high-tech industry and traditional industry. As a way to enhance self-competitive advantages, "innovation activity" has been a new topic among SMEs. The SMEs obtained competitive advantages through continuous learning and knowledge creation instead of living on scarce resources simply. With the development of China's reform and opening up, the voice industrial transformation and improvement are rising, and it has become a hot and difficult issue placed in front of academy, business and government that how local businesses can continue to obtain advanced technologies of information and knowledge, and use their own ability to innovate in order to obtain good performance.

In social capital theory, the enterprise external network is considered as a warehouse that contains potential, static and valuable information and resources. The cooperation between enterprises and members of eternal network (costumers, suppliers and industry associations) aims at beneficial information and resources in this warehouse to enhance competence of enterprises themselves (Uzzi, 1996). The closer members of external network are, the more beneficial information, management know-how and knowledge they will exchange, and the lower transaction cost will be. The closer EN also raises capability of management and innovation, as well as broadens marketing channels, finally forms TI competence of enterprises (Zaheer & Bell, 2005). Cassiman and Veugelers (2006) believe this closer relationship can trigger off organizational learning and transfer of knowledge and technology know-how, therefore upgrading capability of R & D and innovation. However, how many the external access to information sources there are? How to acquire new knowledge and useful information for innovation within the enterprise?

2. Theoretical analysis of the mechanism

Gao (2008) indicated that network within the local cluster and FDI network make up the access for local firms to get external information, but they have different effect on firms' innovation capability. This kind of mechanism can also apply on internal technology from variety external information spillover, but knowledge acquisition channels should be classified. So Figure 1 gives us specific conduction mechanism. FDI can deliver message to local enterprise by horizontal spillover effect and vertical spillover effect. Meanwhile, in the local industrial clusters, local business network spillover effect and local institute spillover effect will bring new information to the local enterprise. However, whether these information can be converted into innovation depends on whether enterprises have identification, absorptive capability (knowledge transfer capabilities), or integration, restructure and intensify capacity (knowledge production capacity). In short, the achievement of "external network effect- innovation" mechanism needs external network and innovation capability working together. As long as one part breaks down, it cannot be achieved that the SMEs in the local clusters attempt to get innovation performance by external network and resource.



Figure 1 Conceptual model for research framework

3. Literature Review and Propositions

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3.1 FDI spillover effects and innovation

Foreign invested enterprises' coming brings new information and the signals of innovation to the local firms, which reluctantly enhance the innovation capability and performance of local enterprises. Kugler (2000), Smarzynska (2004) and Wang et al. (2010) made use of data from Colombia, Lithuania and China respectively, and came to a conclusion that the local enterprise's TFP can be improved by contact to foreign invest companies. Some scholars believe that the horizontal spillover effect is more effective. Blomstrom and Sjoholm (1999) considered the location of foreign enterprises will certainly bring intangible competitive pressures to local enterprise, thus compel local enterprise to constantly update information and innovate. Additionally, the foreign invested enterprises urgently needed to recruit and train local skilled workers and managers. Once these "outstanding workers "start innovation or switch to local businesses, they will imitate innovation by themselves or with the assist of local enterprise. Other studies have considered vertical spillover effect more effective, because the cooperation within the industry will avoid rent dissipation of knowledge and technology, so vertical overflow containing incentive technology can prevent local rivals getting profits. Based on 1996-2000 data from Lithuania, Smarzynska (2004) using the classical production function to analyse and found that establish vertical linkages within the industry enables local businesses to generate higher innovation performance. Liu (2006) collecting data from Chinese manufacturing firms and studied on the FDI spillover effect, the results showed that, as foreign local suppliers, contacts and cooperation within the industry is the most important technical information and knowledge acquisition channel. On the basis of the above considerations, the following hypotheses are proposed in a China context:

H1: FDI spillover effects positively affect innovation performance of local enterprises.

3.2 Local business spillover effects and the innovation

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Since Thorelli (1986) firstly proposed to classify the quality and quantity of local business network, many scholars began to examine the impact of local business networks and innovation performance from knowledge spillover. Through empirical research on SMEs in Xinchu Industrial Park, Chang (2002) proved the relationship between the local business spillover and enterprise products, technological innovation as well as financial competitiveness. However, many scholars have conducted research to explore whether different business members' connection with enterprise have the same impact on technology innovation? Lee and Lee (2001) indicated that all kinds of local business spillover effects have a positive impact on innovation performance of local firms. After dividing the mutual information spillover into D&R information and marketing strategies information, in which studied business reciprocity situation with upstream (suppliers), downstream companies (customers) and peer companies, and collecting the data from 52 bicycle enterprises in Taiwan, Samson (2005) found that the strength of mutual information performance. On the basis of the above considerations, the following hypotheses are proposed in a China context:

H2: Local business spillover effects positively affect innovation performance of local enterprises.

3.3 Local institute spillover effects and the innovation

Many empirical studies showed that local institute ties do have significant effects on local firms' innovation performance through knowledge spillover (Kokko & Thang, 2014). Using data collected from 212 marketing firms in Taiwan, Tsai (2006) empirically investigated the effect of local institute spillover on innovation performance by constructing a SEM model. Gao et al. (2008) examined the relationship among government ties, absorptive capability and local firms' innovation performance, and the result indicates that the absorptive capability can influence the effect of local government tie and university tie on firm's innovation performance. After empirical studies, similar conclusion was given that the effect of local institute spillover effects

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can significantly improve local firms' innovation performance (Fey & Birkinshaw, 2005). On the basis of the above considerations, the following hypotheses are proposed in a China context:

H3: Local institute spillover effects positively affect innovation performance of local enterprises.

3.4 The Moderating Effect of Innovation capability

Because the presence of external knowledge and information have the characteristics of public goods, it didn't mean that local enterprise must be able to master these techniques once they approach them, and it all depends on the capability that local enterprise have to absorb and transfer the information. Innovation capacity concluded the ability of local enterprises to acquire information, product development capabilities production and improvement capabilities. The knowledge production capacity means the ability to create new knowledge, restructuring and activating knowledge, and knowledge transformation capacity is the capacity to accept knowledge and transfer knowledge from the sender to receiver (Argote & Ingram, 2000). When knowledge flow among those enterprises through the knowledge transfer, diversification and differentiation of knowledge allows companies to expand the breadth and depth of knowledge sharing and improve the rate of enterprises learning, which is conducive to the formation of enterprise innovation ability, to further promote value creation, enhance innovation performance (Zahra, 2000).

Local enterprises' innovation activities are done in the "learning by doing" by learning, imitating, innovating and re-creating in the competition with foreign links to achieve innovation performance. Through "learning by doing", local enterprises continue to shorten the gap with foreign firm's innovation capability and obtain the corresponding innovations. Visibly, innovation capability will determine the effect that firms transform external information and knowledge into innovation performance. Borensztein et al (1999) try to use the human capital to measure the absorption capacity of the host country, the results show that the promotion of FDI

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in the economy of the host country's human capital related, FDI combined the host country's human capital play significant role in economic growth.

In addition, the results of R & D investment will enhance the enterprise's ability to learn, imitate foreign technology and re-innovation, and allow enterprises to have a stronger ability to absorb and integrate external resources and innovation. To address this issue, Kathuria (2001) showed that spillover effects of multinationals are not automatically generated, if domestic enterprises want to get benefit, you must invest in their own ability to integrate resources. In short, their own resources' integration, restructuring and intensification capacity (knowledge production capacity) is an important reason for affect the strength of the production performance, the stronger the innovation capacity local enterprises have, the higher efficiency on absorbing FDI spillover information and restructuring the knowledge it has, the more innovation they ultimately will get. On the basis of the above considerations, the following hypotheses are proposed in a China context:

H4: Knowledge production capability has a moderating effect on the relationship between knowledge spillover and innovation performance. Knowledge spillover includes FDI spillover effect, local business spillover effect and local institute spillover effect.

H5: Knowledge transformation capability has a moderating effect on the relationship between knowledge spillover and innovation performance. Knowledge spillover includes FDI spillover effect, local business spillover effect and local institute spillover effect.

4. Research Methodology and Data

4.1 Data and Samples

A questionnaire survey was adopted for conducting an empirical analysis. First, a small-scale pilot test was conducted on senior and middle managers or principals who belong to the small

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and medium enterprises cluster in order to test rationality and details of target enterprise of questionnaires. In addition, to make respondents clearly understand questionnaires, there is refinement according to re-investigation and consecutive interview. The questionnaire survey was conducted in eight cities of Fujian and Guangdong province, two of the most developed regions in China. 600 questionnaires were distributed, and 387 respondent questionnaires were regained altogether. The total respondent rate of the questionnaire is 64.50%. In all, there are 325 matched respondent questionnaires. The matched respondent rate of the questionnaire was 54.17%. Table 1 shows basic information of the 325 sample firms.

| Object | Criterion | Frequency | Percentage | |
|------------------|----------------------|-----------|------------|--|
| No. of Employees | Less than 100 | 192 | 59.38% | |
| No. of Employees | More than 100 | 132 | 40.62% | |
| Years of | Less than 7 | 134 | 41.23% | |
| Operation | More than 7 | 191 | 58.77% | |
| Industry Type | High-tech industry | 155 | 47.69% | |
| | Traditional industry | 170 | 52.31% | |
| | Pearl River Delta | 1 / 1 | 42 200/ | |
| Region | area | 141 | 43.38%0 | |
| | Other area | 184 | 56.62% | |

 Table 1 Demographic characteristics of the sample firms

In addition, classical researches indicate that conditions of enterprises, organizational structure and external circumstances significantly devote themselves to innovation performance. So this paper controls following factors that may affect local firms' innovation performance, including the age, size (number of employees), sort of sectors and location. Precisely based on questionnaires, we put point 1 to the dummy which stands for enterprises with age more than



average 6.2 years, with size more than 200 employees, firms belong to high technology industry and firms locate at Pearl-River-Delta area, then 0 to the dummy of the rest.

4.2 Variables Measure and Questionnaire Design

Questionnaire items of FDI spillover effects refer to quantification and classification by Thompson (2002), in which consist of eleven items measuring different spillover effects. Items of local spillover effect come cite reference from researches by Lee and Lee (2001). Local business spillover can be measured by eight items grouped such characteristics into three categories of intensity and scale. Eight items was proposed to measure local institute spillover including intensity and scale. Three items measuring knowledge production capability and six items measuring knowledge transformation capability could be taken as important variables impacting firms' innovation capability originating from researches by Lane and Lubaklkin (1998). Five items citing from their research of Bell (2005) can be used to measure innovation performance.

To ensure compatibility and consistency of the survey questionnaire, reverse translation and further modifications were also performed. Respondents rated their perceptions of the items using seven-point Likert-type scales, which range from 'strongly agree' to 'strongly disagree'.

4.3 Factor Analysis, Reliability and Validity Test

Since developed from the previous literatures and consultation of experts, items have content validity. Then we give CFA to all models and as it is presented in Table 2, all indexes of CFI, GFI, NFI, RMR, RMSEA and χ^2/df are applicable, and parameter estimation is in effect.T (Branka et al., 2014). Table 2 also gives result of variables' EFA, reliability α and composite α of each variables all exceed 0.75, which means that the questionnaires has incredible content reliability. KMO of each variable as well as exceeds 0.80 and cumulative factorial explanations almost more than 0.75, therefore all items have applicable structural validity.

| able 2 Result | of analysis on v | ariables | | | |
|-----------------------------------|---|----------|---|-------|---|
| Variable | Factor | Items | Composi te Reliabilit y (α) | КМО | Indexes of CFA |
| | FDI Spillover Effect | 6 | | 0.813 | |
| Knowledge Spillover Effects | Local Business Spillover Effect | 5 | 0.903 | 0.879 | GFI=0.93,CFI=0.97, NNFI=0.95,RMSEA =0.038 |
| | Local Institute Spillover Effect | 12 | | 0.832 | |
| Innovation | Knowledge Production Capability | 3 | 0.872 | 0.832 | GFI=0.95,CFI=0.99, NNFI=0.97,RMSEA |
| Саравшту | Transformati 6 0.807 on Capability | 0.807 | =0.018 | | |
| Innovation Performan ce | Innovation Performance | 5 | 0.762 | / | GFI=0.95,CFI=0.99, NNFI=0.97,RMSEA =0.011 |

5. Research Results

To test research hypotheses of this study, hierarchical multiple regression was performed by using the SPSS 16.0 software. Results are shown in table 4 and overall models provide good fit with the data. More important, Table 3 lists average, stand deviation and correlation test. Obviously, FDI spillover effect, local business spillover effect, local institute spillover effect, knowledge production, knowledge transformation, innovation performance and control variables

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significantly correlate with each other. We can see from the relationship between those variables is positive and significant.

Before doing the hierarchical regression analysis, we made the following data processing First, since the variables studied in this paper are all multi-items, we adding the value of all items of the variable to reflect the overall level of the variable .Secondly, the variables that should be control in this study include: numbers of employees, years of operation, industry type and region. In addition, taking into account the impact of the interaction, we use hierarchical regression model, which means doing data analysis by adding control variables, independent variable, and interaction term step by step. Meanwhile, in order to eliminate the Multi-collinearity problem from interaction term, we brought them into the regression after centralization.

| Variable | AVE | S.D. | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------|------|------|----------|----------|----------|---------|---------|---|
| 1.Innovation | 4.92 | 0.83 | 1 | | | | | |
| performance | 1.06 | 1.02 | 0.402*** | 1 | | | | |
| 2.FD1 spillovers | 4.90 | 1.05 | 0.403 | 1 | | | | |
| 3. Local | 5.12 | 1.07 | 0.421*** | 0.289*** | 1 | | | |
| business | | | | | | | | |
| spillovers | 1 10 | 1 28 | 0 270*** | 0 263*** | 0 203*** | 1 | | |
| institute | т.т/ | 1.20 | 0.277 | 0.205 | 0.275 | 1 | | |
| spillovers | | | de de de | | | d. d. | | |
| 5.Knowledge | 4.73 | 1.03 | 0.285*** | 0.277*** | 0.214** | 0.228** | 1 | |
| production 6 knowledge | 1.85 | 0.04 | 0 324*** | 0.220** | 0 252*** | 0.202** | 0 231** | 1 |
| transformation | 4.03 | 0.24 | 0.324 | 0.220 | 0.232 | 0.202 | 0.231 | 1 |
| | | | | | | | | |

| Table 3 Mean | . standard | deviations. | and | correlations |
|--------------|------------|-------------|-----|--------------|
| | , | | | |

Note: * P<0.10, ** P<0.05, *** P<0.01

Table 4 shows the result of hierarchy regression analysis. First, we put four control variables (including numbers of employees, years of operation, industry type and region) and three

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spillover effects into model 1, so model 1 is only regression analysis of dummy variables and independent variables, model 1 with R^2 value is 0.318 and F value is 13.848 and significant (P<0.01). In model 1, regression coefficients of three spillover effects and innovation performance are significantly positive, the regression coefficients are 0.362 (P<0.01), 0.251 (P<0.01), and 0.179 (P<0.05) respectively. Therefore, hypothesis 1, hypothesis 2, and hypothesis 1 have been tested by model 1.

Two moderator variables (knowledge production capability and knowledge transformation capability) were put into Model 2, and the regression analysis result is that, both of their regression coefficients are significantly positive, the regression coefficients are 0.151 (P<0.10), 0.162 (P<0.10) respectively. After model 3 put the interaction between knowledge production capability and three knowledge spillover effects into regression analysis model, and the result is that, model 3 with R^2 value is 0.436 and F value is 18.758 and significant (P<0.01). Meanwhile, the regression coefficients of three knowledge spillover effects (FDI spillover effect, local business spillover effect, local institute spillover effect) and knowledge production capability are significantly positive, the regression coefficients are 0.291 (P<0.01), 0.168 (P<0.10) and 0.186 (P<0.05) respectively. Therefore, it proves that the stronger knowledge production ability local enterprises have, the better enterprises can utilize the new and useful spillover knowledge from these three channels. So, hypothesis 4 has been tested by model 3.

Table 4 Result of hierarchy regression analysis

| Variablas | | Dependent variable: innovation performance | | | | |
|------------------|----------------------------------|--|---------------------|---------------------|---------------------|--|
| variables | | Model 1 | Model 2 | Model 3 | Model 4 | |
| | Firm size | -0.069 | -0.093 | -0.093 | -0.086 | |
| Control | Firm age | 0.276*** | 0.223** | 0.223** | 0.174 ^{**} | |
| variables | Industry type | 0.189** | 0.176** | 0.176 ^{**} | 0.164* | |
| | Regional differences | 0.085 | 0.073 | 0.073 | 0.070 | |
| Indonando | FDI spillover effect | 0.362*** | 0.326*** | 0.303*** | 0.307* | |
| nt | Local business spillover effect | 0.251*** | 0.260*** | 0.228 ^{**} | 0.249*** | |
| III variablas | Local institute spillover effect | 0.179*** | 0.174 ^{**} | 0.166* | 0.159 [*] | |
| variables | Production capability | | 0.151 [*] | 0.145 | 0.155 [*] | |
| Moderator | Transformation capability | | 0.162* | 0.167^{*} | 0.168* | |
| | Production capability× | | | 0 201*** | | |
| | FDI spillover effect | | | 0.291 | | |
| | Production capability× | | | 0.168* | | |
| | Local business spillover effect | | | 0.100 | | |
| | Production capability× | | | 0 186** | | |
| | Local institute spillover effect | | | 0.100 | | |
| Interaction | Transformation capability× | | | | 0 264*** | |
| s | FDI spillover effect | | | | 0.201 | |
| 5 | Transformation capability× | | | | 0 129 | |
| | Local business spillover effect | | | | 0.12) | |
| | Transformation capability× | | | | 0 143 | |
| | Local institute spillover effect | | | | 0.115 | |
| | R ² | 0.318 | 0.342 | 0.436 | 0.429 | |
| | ►R ² | *** | 0.024 | 0.094 | 0.087 | |
| Parameters | F | 13.848*** | 16.285*** | 18.758*** | 19.357*** | |

Note: *P<0.10 **P<0.05 ***P<0.01 (two-tailed test)

Model 4 put the interaction between knowledge transformation capability and three knowledge spillover effects into regression analysis model, and the result is that, model 4 with R^2 value is 0.429 and F value is 19.357 and significant (P<0.01). Meanwhile, the coefficient of interaction term of only FDI spillover effect and knowledge transformation capability is significantly positive, the regression coefficient is 0.264 (P<0.01). Therefore, hypothesis 4 is not completely

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right, and it should be corrected as, the stronger knowledge transformation capability enterprises have, the bigger effect that FDI spillover effect has on the innovation performance.

6. Conclusion and discussion

Based on research conclusions and results from the in-depth interview survey, some advices are given to SMEs on how to improve technology innovation and obtain useful knowledge from external market members.

Firstly, three type of knowledge spillover effects should be taken seriously and to distinguish. The network of cooperation and competition with foreign relations should be developed positively, with particular emphasis on building a horizontal network. Meanwhile, the local business network and local institute network in the cluster are the information sources to help local enterprises consistently innovate, in which need multi-pronged efforts to maintain these relationships. Because of their important role in innovation performance, companies should establish their own brand reputation both outside the cluster as well as inside the cluster, and strengthen the understanding of each other, thus creating a harmonious, relaxed atmosphere for bilateral cooperation. As a company inside a cluster, we should maintain strong relationships inside and outside the cluster and actively participate in cooperation and competition within and outside the cluster to consistently obtain new information. However, different information sources given us different information and knowledge, and getting different information means that you must use different ways to absorb and utilize.

Secondly, try hard to improve their innovation capability. As we all know, it is not enough if local firms only owned a wealth of external information in a cluster, and they need to know how to organize, restructuring, stimulate these external useful information, or to identify, attract them and then innovate. As arousing the importance of intellectual property protection and improving the legal system, a simple imitation and copy cannot bring benefits to the enterprise. It depends



on their innovation ability whether they will transform and innovate after the introduction, learning and imitation. Therefore, companies can increase R&D investment, the introduction of technical personnel, and collaboration with research and related institutions to improve knowledge production capability and knowledge transformation capability.

Last but not least, different external information sources need to provide a complete set of innovative capabilities. The new information from the lateral spill, along with the knowledge of the production capacity and knowledge transfer capabilities can be effectively absorbed and transformed. The new information from the foreign, are generally more advanced technology stuff. Firstly, you must identify, organize and inspire them according to the need of restructure. In addition, it should be recognized and absorbed by the R&D personnel. Then seek for research institutions to do technical testing, research and development, and ultimately become innovation performance. As for the new information from partnership network and sponsorship network, the knowledge production capability is the key to its ability to translate into innovations. Because, for other companies new technologies and new products among enterprises in the cluster, is not difficult to imitate, as long as one company get it , and make simple organization and improvement, its new features can be stimulated, it also means innovations directly. Meanwhile, the new information given by the government to their funding member is funded by a one-way relationship, which does not need to have the ability to absorb and research, as long as implying new ideas and new programs, they will be able to get into production innovation performance.

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SR software and its entrepreneurial attempt in a franchisee model of business

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Abstract

Risk is an unfavorable uncertainty which is apriori estimated, though can never be calculated, by the entrepreneur. Establishing a business and making it a brand is a herculean task but still many start with a hope. Some even go for franchisee model in their entrepreneurial initiative that normally offers a leverage of guidance from the franchise brand. In spite of having a brand support, there are other factors like competition, market size, pricing etc. that are detrimental to the success of any venture. This is a narration of one such entrepreneur who took a franchisee of an IT training center in tier II city of India. A stage came where he had to decide either to close the business to prevent further loss or to take up the risk of reviving the business with a radical change of strategy.



INTRODUCTION

Being the second most populous nation of the world, the biggest challenge for the Indian government was to provide employment for the growing population. With the advent of New Economic Policy in 1991, the GDP composition of Indian Economy was expected to change in the coming decades. The 'third wave' of Alvin Toffler started to hit the Indian economy. The contribution of service sector to the GDP of Indian economy was continuously growing and it increased from 43% in 1991-92 to 58% in 2010-11. The opening of Indian economy not only generated employment but also created a lot of entrepreneurial opportunity as well. India soon became a favorite destination for IT (Information Technology) and ITES (Information Technology Enabled Services). To cater to the needs of MNCs, IT training centers were mushrooming across India. One such training division was SR software, located in Madurai, one of the ancient cities of the country.

SR software was owned by Mr.Pranesh, a second generation entrepreneur of Madurai, Tamil Nadu (TN), India. He mainly started the center to offer software coaching. He also tried to get BPO / KPO projects from US and Europe.

Entrepreneurial opportunity

In February 2008, one of his class mates who was an engineer at a software company, Bangalore, came to know about the franchise from a reputed software testing company and referred it to Pranesh. Even though his knowledge on IT industry or testing was nil, still he was looking for an exciting business opportunity particularly related to IT was eager to go for it. At that time there were neither branded nor unbranded software testing centers in southern TN. He did not have any idea about the demand for this software course in that region or the affordability of the students. He solely relied on his friend's suggestion for starting this business. For this, he finalized a commercial space for the setup by paying a rent advance of Rs 96,000 for 12 months that is 8,000 per month. The rent was to be kept constant for next 3 years.

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End of February, Pranesh went to the Centre Head Quarters (HQ) to attend the interview for the franchise. The HQ had franchisees in almost all the major cities. In southern TN, they didn't have any center. They wanted to expand and were looking for active partners to run their center. Pranesh had good academic credentials. He was already in business and had a good understanding about the market and business terms. Hence, attending and cracking a business interview was not a big deal for him. The interviewer assured that the return from such an investment would be tripled in three years. The business officially started in July 2008 and immediately got student admissions as the franchisor was already advertising for the courses.

Madurai

Madurai District is situated in the South of Tamil Nadu state, India. Madurai Kamaraj University, one of the reputed universities in Madurai already had more than 100 affiliated Arts and Science colleges in and around the neighboring districts. There were also autonomous colleges, aided colleges, self-financing colleges, constituent colleges, evening colleges and other approved institutions in the districts. There were several polytechnic institutions and engineering colleges in and around Madurai city as well.

Madurai is promoted as a tier II city for establishing IT companies, BPOs and KPOs. There were only a few small and medium sized software companies. Honeywell Technology Solutions had opened their offices in Madurai and were operating successfully for more than a decade. Software Technology Parks of India, an agency of the Government of India, had permitted several such companies to receive benefits under its national information technology development program. The state government had proposed two IT based Special Economic Zones (SEZ) in Madurai and small IT companies started blooming in that zone.

ABOUT SOFTWARE TESTING

Software testing provides an objective as well as an independent view of the software to allow the business to appreciate and understand the risks of software implementation. Test techniques

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include, but are not limited to, the process of executing a program or application with the intent of finding software bugs. It is the process of validating whether a 'software program' meets the requirements of the clients or not. It checks if the program works as per the required design. While testing, a tester evaluates the components of the 'program' and checks for any error or missing requirements as defined by the client. The software testing, in simple terms, tells about the quality of the 'programming' to avoid the problems at the implementation level.

INDUSTRY STANDARD FOR NUMBER OF TESTERS

Compared to the programmers or software developers employed, the number of software testers in a company are very less. As per the international standards, there should be at least one tester per developer and is followed in European countries only. In India, A++ grading companies generally recruit one tester per team of ten developers, but unfortunately it's not followed by many companies.

ABOUT THE SOFTWARE TESTING SERVICE CENTER HQ

The parent software testing center offered widest range of certification courses in the field and was the leader in that market for this particular product. The course modules were developed by technological experts from the industry and academicians from leading institutes like IITs and NITs. The testing center had operated in almost all the metros of the country through franchise model. They also provided software testing services to the global clients through their corporate office located in Chennai.

The franchisor demanded a minimum of 2000 Sqft area from the business partners, having at least three Classrooms, a reception area, one room each for Branch Manager (BM), Managing Director (MD) and a system administrator.



RESPONSIBILITY SHARING BY FRANCHISOR

The HQ offered to support SR software in all their marketing activities and will be responsible for giving advertising in the major dailies. The BM and the counselors would be given complete orientation about the products and services of the company in addition to providing technical training for the faculties recruited, in terms of handling theory as well as practical classes. The classes were based on the course ware. Most importantly, the HQ agreed to provide placement support but did not assure any placement during the time of admission of students. However, SR had to fully pay faculties and staff a sum of Rs.50,000 as monthly salary. Similarly, for the two major courses they were offering, it had to bear study material cost of around Rs.1000 per head for white box and Rs.4000 for black box course. Average ancillary expenses, per year, was Rs.40,000.

They demanded the following from the franchisees:

1. Space (as mentioned above)

2. Infrastructure (interiors) to be created by the entrepreneur as per the directions given by the HQ like color, number of class rooms, and the manner of partitions etc. The company wanted uniformity among all their franchisees.

3. Payment of Rs.2 lacs for royalty to be paid at an interval of every three years

4. 10% marketing expenses to be paid to HQ at the end of the year (one ad twice a month, each costing Rs.1,000, on the Wednesday edition of 'The Hindu' newspaper covering the whole TN)

COURSES

SR software offered two courses, namely White Box and Black Box Testing. The course duration for the former was three months and the fee was approximately Rs.15, 000. The latter

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one was for a longer duration i.e. one year and the fee was Rs.40, 000. For the black box testing course, programming and implementation knowledge was not required whereas for the white box testing, both the skills were required.

ADMINISTRATION

BM was asked to report to two persons: MD (Mr.Pranesh) and the HQ of the software testing center

The first BM who was employed was a Management graduate. He was very enthusiastic and had good communication skills but his office administration skills were poor. He failed to reach the target and subsequently quit the company in two months. It was observed from his appraisal sheet that he was very irregular too.

His successor was also a Management graduate and a native of the place. He stayed with the company for three years. Though he was not hard hitting by nature he possessed good team building skills and administrative skills. Most importantly, he was loved and respected by the fellow team members.

TARGET CUSTOMERS

The IT industry was the dream career for most of the middle class families as it promised a luxurious life style, good career with a lucrative salary. But the entry was easier predominantly for the engineering candidates only, as programming and software development were either part of their earlier curriculum or more aligned with their subjects. For non-engineering candidates, either there were not much opportunities or getting an entry was very difficult. For such candidates software testing field offered an excellent opportunity to enter IT industry. As mentioned before, Black box course did not demand any type of coding knowledge and hence was opted by students from Arts background. 'White box' course needed certain amount of coding knowledge and was opted by engineering candidates. Generally those students who find it difficult to understand programming language opted testing career. Thus 'testing' career is a

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boon to any student who cannot do programming or develop software but wishes to enter IT industry. So, the target customers for this company were mainly final year students from all streams like Arts, Science and even Diploma. Students' earlier academic record did not matter much.

MARKETING ACTIVITIES

SR needed to cover all southern cities of TN (from Madurai to Kanyakumari, covering four districts in total). The typical marketing activity involved cold calling, visiting colleges and giving seminars to 3rd and 4th year students of all colleges. They also targeted the BPO and KPO employees who wished to switch over to IT industry. There were nearly 150 engineering colleges all over Tamil Nadu and 50 colleges in Southern TN. The Marketing team visited all 50 colleges and delivered seminars and brief presentations about the courses. Students generally questioned about the high fees structure. They also had queries on the potential job opportunities after completion of the course. SR software was unable to guarantee a career because placement was a problem. There were no big IT companies (except Honeywell) in the targeted markets.

STUDENTS INTAKE

The Institute started taking batches from July 2008 and was able to run 5 batches in the initial year. The batch size was 6, 9, 10, 15 and 13 who registered for the White Box Course and simultaneously they ran one batch of 15 students for Black Box course too. In the consecutive 2 years, white box received 5 and 2 batches which were having an average of 10 and 9 students respectively. Similarly, during the same time period black box could manage to get only 2 and 1 batch with 7 and 5 students respectively. When the number of students started coming down, they increased the fees with the prior approval of the HQ to meet target profit.



During their marketing activities, they gave more effort about product awareness. Unlike other software courses like C, C++, or Java, people had no idea about software testing among the students. As a result, they hesitated to join. The advertisement part was taken care by the HQ. They gave one advertisement twice a month on Wednesday edition of 'The Hindu' newspaper covering the whole TN but unfortunately that advertisement did not seem to be very appealing. As it was obvious, repetition of the same advertisement didn't even generate any increase in number of walk-in inquiries.

When the income started coming down, the MD of SR suggested following slabs for more sustainability of the center: If the net income from business for a given year is between 0 to 2 lacs, SR would give 10% of the collections as royalty, if the income is between 2 to 3 lacs, it was to be 20% and if the income goes above 3 lacs then it would give 30%. This slab gave a win-win solution for both the partners. But the HQ refused and demanded 2 lacs as royalty for 3 years.

PLACEMENT SERVICES

The center solely relied on the HQ for placements. The team at Madurai was more concerned about marketing, converting the walk-ins into admissions and target achievement. There were very few IT industries in and around Madurai. Inspite of SR's efforts, it was not able to place most of their students on its own. Moreover, as mentioned above, the need for software testers in the market was limited. Because of poor placement in the center, the admissions started shrinking.

AND FINALLY...

After paying the franchisee fees, salary and running expenses, the net profit was very low. The BM had built a wonderful team and made them work together. As a result of their hard work, the company earned good profit in 2009-10. But when the collections declined next year, the team also started to break. The BM resigned followed by the resignation of both the faculty and the

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counselor. It was not a planned coincidence. They partly realized that the center had already reached its maximum earning potential and neither further expansion nor further scope of improvement was visible. Still SR had the advantage of monopoly in the market as the only testing training center and there were neither branded nor unbranded software testing centers in and around Madurai. Pranesh was not sure whether to continue the business or not. He was in confusion whether it could be sustainable in the long run. Pranesh's close friend was earning 15% return on a similar investment that time and it was constantly bothering Pranesh. During early 2011, realizing the situation, the HQ deputed Mr.Rasheed, marketing in charge and IT head of the business, to Madurai and counsel Pranesh. According to Rasheed, it was too early to close the business as the IT market was about to boom. In his opinion, Pranesh could wait for one more year. They can run the business with a new team of people. Even the HQ was ready to assist Pranesh in recruiting and training them.

He was about to facilitate a meeting with the franchisees from other cities who were successful in their attempt so that Pranesh can learn and implement those strategies but at the same time, Pranesh received a call from his friend Rajesh who was in US. Rajesh was contemplating a business training division center in India preferably in Madurai. He told Pranesh to look for a place where he can set up a center. The description told by Rajesh for the proposed center was matching with Pranesh's current set up. The center had well decorated interior architecture and the market value of the full set up was around Rs. 3.5 lac to 4 lac.

For Pranesh, selling the setup was a 'now or never opportunity' and reviving the business as per the suggestion of the HQ was equivalent to taking up a big risk. For the HQ, closing of their franchisee down south was not only a financial loss but it would also shrink their market share. It would affect their brand image in the market as well. As per the predictions of the HQ, shortly there would be more IT and ITES and thus more demand for software testers. So, they were very genuine in their attempt to help Pranesh.



1. Was it too early to sell as suggested by Rasheed or it better to wind up and prevent further losses?

2. Was the financial feasibility of SR questionable? Justify.

3. Help them create a new add which is more appealing than.

4. What could have been done to reduce the attrition? How can one bring a balance between campus & placement?



EXHIBIT A

ADMINISTRATIVE STRUCTURE - SR SOFTWARE



Exhibit B

| Initial Capital Expenditure | |
|------------------------------|--------|
| Particulars | Rs. |
| Franchisee Deposit money | 200000 |
| Rent Advance | 100000 |
| Infrastructure and Interiors | 900000 |
| Other ancillary expense | 300000 |

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| Total CAPEX till May | 1500000 |
|-----------------------------------|---------|
| | |
| Expected Revenue per Month | |
| Particulars | Rs. |
| Gross Collection | 250000 |
| | |
| Total (A) | 250000 |
| | |
| Expected Operation expense per | |
| Month | |
| | |
| Particulars | Rs. |
| Salary | 50000 |
| Royalty | 50000 |
| Marketing Expense | 25000 |
| Study Material | 20000 |
| EB | 6000 |
| Stationary | 5000 |
| Other Expense | 5000 |
| Rent | 12000 |
| Total Revenue Expenditure (B) | 173000 |
| | |
| Expected Net Income before | |
| Tax per Month C=(A)-(B) | 77000 |
| Less: 10% Service Tax on | |

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| Gross Collection (D) | 25000 |
|------------------------|--------|
| | |
| Profit After Tax E=C-D | 52000 |
| | |
| Annual PAT | 624000 |
| | |
| Return on Investment % | 41.6 |

Exhibit C

Tamil Nadu, India



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development. *Information Economics and Policy*, *14*(2), 253-273.
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</u>



Teaching Note CASE SYNOPSIS

Risk taking' trait is the differentiating factor between entrepreneur and others. Still the risk should be a 'Calculated risk' else they will be termed as gamblers rather than skilled entrepreneurs. Not everyone has the potential or resources to start or establish a branded business. So, some of them adopt franchisee model in their entrepreneurial attempt. Whatever the brand, there are other factors that decide the success of the business (environment, marketing strategy and personal skill in managing the business etc).

BASIC ISSUE AND KEY POINTS

Here the basic issue is about making right business decision. The question is whether the entrepreneur should learn from the mistake, rectify and proceed as per the suggestion of the head quarter (HQ) or should he sell the set up and prevent further loss. The key point is that making failed to take off in the first two years; it will be difficult for the centre to make further profit. In the product life cycle or in the organizational life cycle, initial period is an important period where the motivation of the work force will be high and the product is also new to the market as well. Moreover if the saturation level is attained, it would be difficult to expect further profit. So the better decision is to sell the centre set up and try to take the maximum capital.

LEVEL OF ANALYSIS

The case is designed primarily for the post graduate students. Since there are nothing technical or more complex issues to understand, this case can be discussed in undergraduate business courses as well apart from the post graduation level.

More than the freshers undertaking a post graduate or undergraduate course, this is an ideal case that can be discussed among the working executives in the MDP or training session as they can float their business thoughts and the discussion can centre on the decision of whether to continue or close.

SUGGESTED STUDENT ASSIGNMENT

The students can be asked to come prepared for the session with an assignment on importance of business environment. The assignment should address the following questions:

1. The product was a branded one. There were enough colleges in the market. But still the franchise did not generate super profit. Where did Mr. Pranesh fail in his entrepreneurial attempt?

2. What are the factors that can affect the business in the external environment?

3. What is seasonality or volatility factor in the business performance?

4. Discuss the importance of customization (here, the pricing factor) according to the local needs.

5. Among all the factors discussed (pricing, innovative advertisement, placement, product awareness) which is the major factor attributing to the failure of the business?

6. Discuss the importance of product awareness and post sales service in the service sector.

7. Decision making: Should he take risk and run the business or sell and prevent the further loss? Or any other option is there?

SUGGESTED ADDITIONAL READING

Students should have a prerequisite knowledge of marketing management, service marketing and entrepreneurship in order to have fruitful discussions. Some knowledge of compensation plans of marketing teams will also help.

POSSIBLE DISCUSSION QUESTIONS

There are three important questions: one is related to marketing like pricing of the product, product or brand awareness, advertisement and post sales service. Having discussed and asking the students to list any other relevant factor, the instructor can ask them to bring out the factor which has maximum impact on business (in this case).

The final discussion can revolve around effective administration: was the business managed well? Was there any personal inefficiency that caused the failure? Students can be asked to part is should he go for the continuation of the business or close down.
POTENTIAL USE OF THE CASE

The case can be discussed in the context of marketing (pricing, positioning, market feasibility study, post sales service, brand or product awareness), entrepreneurship, decision making and organizational theory (impact of environment and technology).

ANALYSIS

The analysis can be divided into pre (before taking the franchisee), during (the operation of the business) and post operative (at the time of closing) stage.

The product was a branded one. There were enough colleges in the market. But still the franchise did not generate super profit. Where did Mr. Pranesh fail in his entrepreneurial attempt?

Though the product was a branded one, the opportunity for the placement was limited even there are some companies. In case of tier II cities, as mentioned in the case, even now there are few companies and the scope for placement become still less. Mr.Pranesh was late in his tapping the opportunity in IT field. He should have taken opportunity in 2000 or late 90s. During that period, the opportunities were very bright. There were rush for the IT courses in institutes like SSI and NIIT. At that time, there were few colleges that offered IT related courses.

Pricing of the product should be customized according to the places (where they are being run) and the buying power of the consumers. Sachet Marketing' of Hindustan Levers in India is an example of such customization. The Shampoo sachets were produced particularly to target the 'bottom of the pyramid market' of the country. Such products are available in smaller quantities against the traditional big bottles or packets, to better suit the income and cash flow of middle class individuals of the nation. In this Franchisee model the initial investment was too heavy. The centre was modeled by the HQ which incurred huge investment in terms of interior. The MD need to pay non refundable deposit to the HQ. They insisted uniform centre set up, franchisee fee as they demand for the other metro cities. This is to ensure the brand name and uniformity. But the return on income was not same as they are in metro. It is because (as per the opinion of the MD) the marketing potential is not same for tier I (Chennai, Bangalore and



Hyderabad) and tier II city like Madurai. Moreover the total initial investment was Rs.15.5 lac. Had it been between 5 to 6 lac, even the 9 lac income (first year income) would have been a profit. The centre could have sustained for few more years with less income. The case also cautions the franchisers about the need for **market feasibility study** that should have been carried out before starting the business. It is an evaluation and analysis of the potential of a proposed project. It should have been conducted based on extensive investigation in the market before making a decision. By carrying out such study, he could have known the product awareness, customer's expectations, their affordability etc. such study is necessary to understand the TELOS (refers to the five areas of feasibility - Technical, Economic, Legal, Operational, and Scheduling). They took more effort in making the **brand and product awareness** than marketing. An entrepreneur takes a franchisee because of its well established brand name and it's reach to the target customers. When it didn't happen, this questioned the very advantages of taking a franchisee.

In any business **post sales service** is an integral part. Any software centre is more concerned on getting admission than on placing them. This is applicable to the colleges as well. When the centre realizes that its survival is directly depend on the placement and it was unable to place them, it should have started for alternative arrangement before making loss.

Before taking the franchisee, Pranesh must have thought about the placement potential and pricing affordability of tier II cities like Madurai. Certain roles are few in an organization (Physiotherapist in a hospital, HR person in any company) compare to certain other roles (Nurse in a hospital, marketing persons in any company). Software testers are few in an IT company compared to programmer or web designer. Such in depth analysis, could have helped him to arrive a conclusion before taking a business opportunity.

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Though the product was a branded one, the opportunity for the placement was limited even there are some companies. In case of tier II cities, as mentioned in the case, even now there are few companies and the scope for placement become still less. Mr.Pranesh was late in his tapping the opportunity in IT field. He should have taken opportunity in 2000 or late 90s. During that period, the opportunities were very bright. There were rush for the IT courses in institutes like SSI and NIIT. At that time, there were few colleges that offered IT related courses.

During the operation stage, the major questions is that what the cause of not making profit was. Though there are many factors, the immediate cause is the lack of product as well as brand awareness, product pricing and lack of post sale service – placement.

Pricing of the product should be customized according to the places (where they are being run) and the buying power of the consumers. Sachet Marketing' of Hindustan Levers in India is an example of such customization. The Shampoo sachets were produced particularly to target the 'bottom of the pyramid market' of the country. Such products are available in smaller quantities against the traditional big bottles or packets, to better suit the income and cash flow of middle class individuals of the nation. In this Franchisee model the initial investment was too heavy. The centre was modeled by the HQ which incurred huge investment in terms of interior. The MD need to pay non refundable deposit to the HQ. They insisted uniform centre set up, franchisee fee as they demand for the other metro cities. This is to ensure the brand name and uniformity. But the return on income was not same as they are in metro. It is because (as per the opinion of the MD) the marketing potential is not same for tier I (Chennai, Bangalore and Hyderabad) and tier II city like Madurai. Moreover the total initial investment was Rs.15.5 lac.



Had it been between 5 to 6 lac, even the 9 lac income (first year income) would have been a profit. The centre could have sustained for few more years with less income.

In any business **post sales service** is an integral part. The main expectation from the education institution is the ability to place the students. Any software centre is more concerned on getting admission than on placing them. This is applicable to the colleges as well. When the centre realizes that its survival is directly depend on the placement and it was unable to place them, it should have started for alternative arrangement before making loss.

Pranesh should have concentrated more on placement service from the beginning because that decides the further survival of the business. He could have assigned the task to the marketing team. In the cyber era, with a system and mobile, they could have reached for all the metros for the placement instead of relying on the HQ. The compensation should have been tied with the number of lead generation and placements.

In aftermath period, the key issue is should continue by listening to the new Manager from the HQ or should he close. In terms of decision making, the case has provided only two options. But one should not be bound by these two options alone. As a manager, one should able to develop as much viable alternatives as possible.

Taking further risk is not a calculated move. Moreover it depends upon the perception of the individual. Instead of further incurring loss, it was a good move to close the startup by sensing the future potential of the market. Unless he did some revival strategy by consulting his HQ or other successful owner of the same company, there is no use of continuing the business. There is least possibility of survival as the continuation of the business directly depends upon the ability to place. The HQ will always advice to continue. Had they relay concerned, they should have done something during the struggling time. But they never did. So it is unadvisable and unviable to run the business further. Pranseh is fortunate that he immediately got an offer to sell the set up and wind the business with some huge capital.

Regarding other option, with the same setup he can try some other franchisee that deals with education. A loss in one business doesn't mean that he would loss in all the business. This time



he should have been cautioned about the product awareness, market's willingness to take, his affordability in lean season etc.

Decision making: Should he take risk and run the business or sell and prevent the further loss? Or any other option is there?

In terms of decision making, the case has provided only two options. But one should not be binded by these two options alone. As a manager, one should able to develop as much viable alternatives as possible.

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THE IMPACT OF EXTERNAL ENVIRONMENT AND CHANGE OF TECHNOLOGY **ON THE BUSINESS**

The present globalized business environment is highly interconnected than ever before. Any business is not a closed entity. It affects the external environment and getting affected by external environment which includes economic, technological, socio-cultural, political-legal and global. When the BJP came to power with absolute majority in the 2014 election, it was reflected immediately in the share market. Thus change in any one of the external environment, has a cascading effect on the business. IT industry is totally depends on the western economy as it is predominantly outsourced from the west. Hence, a closer and continuous monitoring of the business environment is essential. While a business started to make profit, the managers in the business should constantly watch the future: will it continue to make the same kind of profit? What if didn't? What are the other options available to us?



Change in technology some time, wiped out totally some of the business (TV antenna, cassette, floppy disc, camera film role etc). In the IT sector, technological change and up gradation is very common. Hence, the present manager has more challenge to predict the change than yesterday's manager.

SUGGESTED TEACHING APPROACH

The class can be divided into and ask them to defend & oppose the decision of closing the business. They can also be asked to take the role of Pranesh and the HQ Manager Rasheed. Apart from this, the case analysis discussion can be around the three stages as suggested above and finally concluding.

With respect to the area of specialization, the case can be discussed in Marketing (pricing, pre and post product stage), HR (compensation) and Finance perspectives (investment, opportunity cost).

PROPOSED SESSION PLAN(S)

0 - 5 minutes - Introduction

5 - 10 minutes - Summary by the students

10 - 30 minutes - Problem identification & discussion of marketing concepts: discussion can be focused on the following: The product was a branded one. There were enough colleges in the market. But still the franchise did not generate super profit. Where did Mr.Pranesh fail in his entrepreneurial attempt?

30 - 60 minutes – Discussion about the impact external environment on business

60 - 75 minutes - Discussion about the decision of Pranesh: discussion can be focused on should he take risk and run the business or sell and prevent the further loss? Or any other option is there?

75 - 90 minutes - Wrap-up and Conclusion

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Sustainable Development Motives A scale development study

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Abstract

Sustainable development motives are well researched but very less focus is given to identify the factors. The present study examines sustainable development motives by factor analysis to identify the underlying factors. The dataset consisted of 283 responses from National Stock Exchange listed companies across India. The result identified three sustainable motives through factor analysis viz., Moral motives, Profitability motives and legitimate motives. The article proposed definition for three motives along with managerial implications.



INTRODUCTION

Human beings, by nature, have unlimited wants to satisfy with limited means, which lead to the current scenario of corporations to exploit the resources indefinitely, resulting in degradation, pollution and unbalanced socio-economic and environmental conditions. In today's competitive world of globalization, every organization is trying to overdo one another to achieve the organizational goals but they are not concentrating on the environment. The criticalities of consequences are underestimated by certain part of the society and some are taking the steps to restore the normalcy through sustainable development. During the industrialization, it is very much evident that the organizations have focused mainly on profits, which later shifted to people focus due to the evolution of Human Resource movement and now the need for the day is to think about planet. The balancing act of the organization between the three Ps namely Profits, People and Planet is termed as Sustainable Development. To achieve the sustainable development there is a need for transforming existing business model into Sustainable business model, which can be established if the organization has sustainable policy and practices in place. But enlisting the policy and practices cannot lead to the sustainable development. What is required is to create consciousness of sustainability in the workforce which creates the organization culture of sustainability through which the goal of sustainable development can be achieved. Corporations are engaged in the process of transforming themselves into organizations that deliver sustainable value beyond mere financial growth and thus contribute to the larger process of sustainable development (WBSCD). Different perspectives of Sustainable development by different people like ecologists, environmental planners, economists and activists explored by Redclift M. (1991). Corporate Sustainable development at an organizational level is described using a triple bottom line (Elkington.J.1997) that divides performance into economic, environmental and social dimensions (Topfer.K.2000). Sustainable industrial development is interpreted as a process of continuous improvement of environmental, economic

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and social performance of enterprises and sustainability performance is interpreted as a result of management of sustainability aspects in enterprises (Staniškis J., Arbačiauskas V., 2004). Dyllick and Hockerts stated that "Meeting the needs of firms; direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, communities, etc.) without compromising its ability to meet the needs of future stakeholders as well" and Lozano in the year 2011 defined Corporate sustainability as "Corporate activities that proactively seek to contribute to sustainability equilibria, including the economic, environmental and social dimensions of today, as well as their inter-relations within and throughout the time dimension (long and short term), while addressing the company's systems i.e. operations and production, management and strategy, organizational systems, procurement and marketing and assessment and communication; as well as with its stakeholders". Corporate or business sustainability can be defined as 'the adoption of business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future' (IISD et al., 1992). Van Kleef and Roome define sustainable business management (SBM) as 'management of business that recognizes its embeddeness in social, environmental and economic systems, and focuses on management and relationships to meet the environmental, social, and economic requirements of many different stakeholders in its networks' (Roome, 1998; van Kleef and Roome, 2007, p. 44). Marrewijk M.V. (2002) in his paper tries to bring out the conceptual clarity and definitions between Corporate Social Responsibility and Corporate Sustainability. Brink T. W.M and Woerd F. (2004) try to study various assessment, measurement and monitoring tools that are currently being used to develop sustainability benchmark. Sharma and Vredenburg (1998) focuses on need for organizations to develop organization resource based view of proactive responsiveness due to consciousness will help it to deal with inherent and uncertain ecological issues. Corporate sustainable development is influenced by institutional factors, media, etc. and over a period of time it becomes resource based opportunity for the organization which is proved by Bansal P. (2005). Sharma and Henriques (2005) found that stakeholders have moved from just pollution

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control and meeting the regulations requirement to more eco-efficiency practices, wherein the waste of one firm is consumed by other organization in its infancy stage leading to more of sustainability. The literature review has focused very less on sustainable motives. Therefore the current study explores different motives of sustainable development in Indian context.

REVIEW LITERATURE

Sustainable Development Motives

There are many motives behind adoption of sustainable policies, practices and other initiatives that corporate are involved in, Ernst & Young survey with GreenBiz group (2012) found that cost reduction, stakeholder's expectations, managing risks, revenue generations and government regulations are key motives for organizations to adopt such practices and they also came out with six facts about sustainable development: CFO's role is on rise, employees are keenly interested and taking part in sustainability programmes, awareness on sustainability is increasing and companies are concentrating on ranking and rating on sustainability. Mckinsey survey on business sustainability reports on different motives leading companies to adopt sustainability are to creating values, new growth opportunities, creating reputation, gain competitive advantage, return on capital. Baxi C.V. & Ray R.S. illustrated the trends in corporate sustainability reporting in India which is gaining importance by big companies and family run businesses due to regulatory pressure and value system respectively. They insist on transparency in reporting the sustainability reporting. SHRM reported that the reporting on sustainability is increasing and companies are leveraging on the concept of sustainable development.

Lozano in his study divided Corporate Sustainable drivers mainly into two i. External - which tend to result in reactive measures being less likely to help towards sustainability ii. Internal which are more proactive (By Desimone and Popoff 2000). Other external motives identified by other researchers are national policies (Macleaod and Lewis), administrative guidance (Fukukawa & Moon, 2004), NGOs, stakeholder pressures (Zadek,1999; Frehs,2003; Fernandez et al,2006). Similarly, other internal motives identified are ethical leadership through change

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(Dawson, 1994; Kotter, 1996; Desimone and Popoff, 2000; Doppelt,2003; Gill, 2003), Risk Management and Protection of business reputation (Lantos,2001; Ditlev-Simonen and Atle, 2011), Economic Value (Carrol, 1999; CEC,2001; Lantos, 2001) and Corporate Image (Frehs, 2003).

Marrewijk M V (2002), divides Corporate Sustainability into five levels with some differentiation for each level which are described as below. Compliance-driven CS (Blue): Organization does welfare to society and responds to charity, stewardships within the limits of regulations and main motive behind sustainability is mere duty and obligations or correct behaviour. Profit-driven CS (Orange): Motive at this level is driven by financial gains to the organization by integrating social, ecological and ethical aspects with business operations. Caring CS (Green): At this level, business balance economical, social and ecological aspects and considers all three are strategically important. The motives here include human potentials, social responsibility and real care for plant. Synergistic CS (Yellow): At this level, organization tries to balance Triple bottom Line to create Value in Social, economic and ecological aspects of corporate performance to create win-win situation with all stakeholders as businesses consider sustainability is integrally important for organization growth.

Holistic CS (Turquoise): Every aspect of organization is embedded fully to contribute to quality and continuation of life of every being and entity, now and in the future. Ultimate motive is sustainability itself as every being, entity is mutually interdependent on each other, and therefore it is responsibility of every person or organization.

As different levels suit different set of organizational needs, context and situation, to implement this, organization needs to understand where they are and where to which level they want to go, which can be achieved through organizational framework and support from employees of organization. Bronn P.S & Cohen D.V. (2009) study identified the motives of managers for adopting the social initiatives. Various motives identified through review literature are measured using 5 point likert scale of strongly agree to strongly disagree. Which are enlisted below:

• My company's leaders are committed to sustainable development.



- My company is most influential in terms of championing climate change mitigation.
- My company is the leader in its sector in terms of dealing with Sustainability issues.
- Attaining sustainable development is primary responsibility of my organization.
- My company adopted sustainability due to stakeholder's pressure.
- The Sustainable strategy of my company is one of the reasons for high profits.
- The Sustainable strategy of my company helps to create value
- The Sustainability strategy adopted by my company gives it competitive advantage.
- My organization, adopted sustainability strategy due to legal pressure.
- Cost effectiveness is being achieved by my organization by adopting Sustainable strategy.
- The Sustainable strategy will lead my organization to new business opportunities.
- The Sustainable strategy will help my organization to manage the risk.
- The Sustainable strategy will improve the shareholder value.
- My company's employees are committed to sustainable development.
- The sustainability strategy will impact the reputation of the organization positively
- Our organization adopted sustainability strategy due to regulators pressure. (PCB, SCB

SEBI, Companies bill etc.)

All this motives will be reduced by using Exploratory Factor analysis.

Research Methodology

Data collection

Primary data was collected through a survey questionnaire illustrating the motives identified by review literature on a five point likert scale. Various secondary sources of data were accessed through databases of Ebesco, Emerald, JASTOR etc. to finalize the motives.

Sample

The target population was working professionals from different industries across top hundred listed companies as it is mandatory SEBI(2012) guidelines, which requires these companies to



publish business responsibility report which focuses on sustainable development. NSE listed companies were approached through email ids to take part in survey. A total 389 completely filled in application were received which sufficies the sample requirement as per Black and Hair (2012).

Results

Factor Analysis

As different motives of sustainable development gives an impression of correlation, it is hard to identify the observed variable; therefore factor analysis is performed to get the factors. Sixteen motives identified through exploratory factor analysis, which are illustrated in review, were processed through scale reduction technique. All identified dimension underlying a factor are prepared in the form of scale in questionnaire to measure assumed factors. Giving the results of factor analysis as depicted in tables. The communalities were depicted in the Table.1.which gives the variance accounted for particular variable by all the factors. Higher the communality value, higher is the amount of variance explained by the extracted factors. Principle component method of extraction was used, as the aim is to reduce the number of variables.

Extraction communalities for variable gives the total variance explained by all the factors, the results indicates that motives of sustainable strategy to manage the risk, improve shareholders value, reason for high profits, impact on reputation of organization explaining 95% of variance, followed by motive that states my organization is influential to championing climate change mitigation, it creates value and reason for adopting sustainable development due to regulatory pressure explaining 84 %, 82% and 81%. Following motives of adopting sustainable development due to legal pressure, helps to create competitive advantage, cost effectiveness, commitment by leaders and employees, stakeholder's pressure, new business opportunity explaining 78%, 74%, 62%, 57%, 52%, 49%, 48% respectively. Motive of leading sustainability issues and giving primary importance to sustainable development explain only 26% and 33% of variance.



Total Variance explained

Table.2. depicts the number of useful factors; initial Eigen values gives variance were explained by all the factors. The second section of the table is extraction sums of squared loadings; which give the factor extractions for variables whose Eigen values are more than 1 and as the extraction method is principal component analysis; percentage explained by these factors are same as percentages of Eigen values. As per the table it is inferred that the cumulative percentage of variance explained by three factors is 69%; the first factor explains 40 % of variation, second factor explains around 15% and third factor explains 13%. The last section of rotated sums of squares indicates the three extracted factors result after rotation.

Component Matrix & Rotated Component Matrix

Table.3. shows the factor loadings results without any rotations which identified three variables; as it evident that some of variables are loading high on two or more factors. This, problem of one variable loading high on two or more factor is solved by rotation component matrix depicted in Table .4. Variables loading values with are more than .40 (Gaur A J & Gaur S S, 2003) are considered to measure the factor are considered under each of the three factors identified. As per the results Factor one constitutes following variables to measure it: motive of cost effectiveness, risk management, improving shareholders value, improve reputation of organization and earning high profits; second factor constitutes following motives of championing climate change mitigation, employees and leaders' commitment towards sustainable development and competitive advantage. The third factor contains the motive of legal pressure, stakeholder's pressure, regulatory pressure and new business opportunity. Depending on loading the identified factors were categorized broadly into Moral motives, Profitability motives and legitimate motives. The variables of leading sustainable issues, considering sustainable development as primary responsibility, creating value are dropped as their values are not significant in measuring any of the three identified factors.

Validity and Reliability

The scales were checked for convergent and divergent validity which were yielded satisfactory results. The three factors identified by factor analysis namely profitability motives, moral motives and legitimate motives were tested for reliability by using Cronbach's Alpha. The values of each factors is depicted in Table.5., which indicates that each of the variable values have exceeded accepted alpha value of .700 and the overall reliability of the scale was .89.

Findings

The three factors of sustainable development derived from factor analysis are profitability, moral and legitimate motives and scale developed is highly reliable to measure the perceived level of sustainable development. The factors identified are similar to the previous study carried out by Reyers M, (2009). The operational definitions of these motives are:

Moral motives:- Intrinsic beliefs of the managers and employees that drive him to follow the sustainability practices

Profitability motives:- Motives that drive the manger to engage in sustainability initiatives to improve the revenues or protecting the existing profit levels.

Legitimate motives:- Motives that drive manager to adapt sustainability due to regulators.

Managerial Implications

The research helps managers to identify the sustainability motives among the employees. Once the motive is identified manager can leverage over it to achieve sustainable development by incentivizing the achievements by employees. Draft policies which foster sustainable development among the employees. Design programmes which cultivate the habit of sustainability among the employees.

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Table1.Communalities

| | | Extractio |
|-----|---------|-----------|
| | Initial | n |
| D1 | 1.000 | .783 |
| D2 | 1.000 | .843 |
| D3 | 1.000 | .267 |
| D4 | 1.000 | .335 |
| D5 | 1.000 | .488 |
| D6 | 1.000 | .524 |
| D7 | 1.000 | .825 |
| D8 | 1.000 | .740 |
| D9 | 1.000 | .573 |
| D10 | 1.000 | .622 |
| D11 | 1.000 | .493 |
| D12 | 1.000 | .952 |
| D13 | 1.000 | .952 |
| D14 | 1.000 | .952 |
| D15 | 1.000 | .952 |
| D16 | 1.000 | .813 |

Extraction Method: Principal Component Analysis.



Compone Extraction Sums of Squared Rotation Sums of Squared Initial Eigenvalues Loadings Loadings nt % of % of % of Varianc Cumulati Varianc Cumulati Varianc Cumulati ve % ve % ve % Total Total Total e e e 1 6.51 6.683 41.767 41.767 6.683 41.767 41.767 40.732 40.732 7 2 2.40 2.402 15.014 56.781 2.402 15.014 56.781 15.058 55.789 9 3 2.18 2.029 12.679 69.459 2.029 12.679 69.459 13.670 69.459 7 11.655 4 .865 81.114 5 7.276 88.390 .164 6 .881 5.504 93.894 7 96.536 .423 2.642 8 98.563 .324 2.027 9 .178 1.112 99.675 10 .052 .325 100.000 2.42E-1.51E-11 100.000 016 015 1.72E-1.07E-12 100.000 015 016 1.19E-13 7.42E-100.000 016 016 14 -1.56E-2.49E-100.000 016 017 15 -7.60E-1.22E-100.000 016 016 16 -3.48E-5.57E-100.000 015 016

Table.2.Total Variance Explained

Extraction Method: Principal Component Analysis.



| | Component | | |
|-----|-----------|------|------|
| | 1 | 2 | 3 |
| D1 | 276 | 516 | .664 |
| D2 | 176 | .858 | 275 |
| D3 | 393 | 274 | 193 |
| D4 | .299 | 176 | 463 |
| D5 | .475 | 334 | .388 |
| D6 | 573 | .195 | .398 |
| D7 | 887 | .184 | 072 |
| D8 | 070 | .704 | .489 |
| D9 | 142 | .585 | .459 |
| D10 | .782 | 039 | 098 |
| D11 | 063 | 201 | .670 |
| D12 | .952 | .200 | .076 |
| D13 | .952 | .200 | .076 |
| D14 | .952 | .200 | .076 |
| D15 | .952 | .200 | .076 |
| D16 | 125 | .264 | .853 |

Table 3. Component Matrix(a)

Extraction Method: Principal Component Analysis. a 3 components extracted.



| | Component | | |
|-----|-----------|------|------|
| | 1 | 2 | 3 |
| D1 | 255 | .091 | .842 |
| D2 | 089 | .499 | 766 |
| D3 | 450 | 252 | .035 |
| D4 | .207 | 484 | 240 |
| D5 | .471 | 094 | .508 |
| D6 | 482 | .509 | .181 |
| D7 | 854 | .262 | 166 |
| D8 | .095 | .851 | 086 |
| D9 | .003 | .756 | 031 |
| D10 | .749 | 242 | 056 |
| D11 | 001 | .289 | .640 |
| D12 | .972 | .014 | 082 |
| D13 | .972 | .014 | 082 |
| D14 | .972 | .014 | 082 |
| D15 | .972 | .014 | 082 |
| D16 | 257 | .281 | .817 |

Table 4..Rotated Component Matrix(a)

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a Rotation converged in 5 iterations.

Table. 5. Reliability test for motives

| Factor | Cronbach's Alpha | Number of variables |
|-------------------|------------------|---------------------|
| Financial motive | .889 | 5 |
| Moral motive | .862 | 4 |
| Legitimate motive | .763 | 4 |

It's the yeast we can do: Untapping Sustainability Trends in Australian Craft Breweries

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1. Introduction

Beer is a product with a simple core recipe: malt, yeast, hops and water. The transformation of these ingredients in varying proportions and application of varying brewing techniques into alcoholic beverage represents a multi-million dollar beer industry. The entry of craft beers into the industry has further expanded the range of beer styles available in the market. In Australia alone, the beer industry produced more than 18 million hectolitres in 2015, generating more than AUD\$4.8 billion in revenue. While the overall consumption of beer in Australia is decreasing,



the craft beer industry has achieved double-digit growth rates over the last five years (IBISWorld, 2015).

In general, beer is perceived as a sustainable product as the main ingredients are naturally and organically produced (Schaltegger, Viere & Zvezdov, 2012). However, the impressive volume of beer production and consumption in Australia and elsewhere comes at a cost. It employs a brewing process that is very water and energy-intensive, thereby leaving a relatively large carbon footprint on the environment through contamination of nearby soil and water bodies, and emission of anthropogenic gases in the air (Fish, 2015).

From an academic perspective, very limited research on sustainability in entrepreneurial craft breweries has been undertaken and is mostly US-centric. As far as the authors are aware, no other study has been undertaken to date that explores sustainability practices in craft breweries in Australia. This paper explores sustainability activities in the craft beer industry using a qualitative research approach based on secondary data and examines current practices to improve the environmental sustainability performance.

2. **Sustainability in Craft Breweries**

2.1 **Craft breweries in Australia**

The 'Craft Beer Industry Association' (CBIA, 2016) in Australia defines an Australian craft brewery as one which is "based in Australia producing less than 40 million litres of beer per annum". According to the Brewer's Association in the US, which can be viewed as the equivalent to the CBIA, craft breweries are also characterised by their independence. Hence no more than 25% of the brewery can be owned or controlled by an industry member that is not a craft brewer (Moran, 2014, p.1).

The history of craft brewing in Australia commences in the 1970s and 1980s. The beginning is characterised by entrepreneurs who were interested in adopting a more European-style brewing



process, which was "opposite of what the big breweries and bars do" in Australia (Smith, 2011, p.1). Drawing from European, American and Anglo origins, Australians began to place more emphasis on beer quality as opposed to quantity (CIBA, 2016). In addition, the internet opened up access to the wider world of beers, bringing information on how to brew better beer, and furthermore, providing insight into what was happening at the cutting, creative edge of the craft brewing industry (Smith, 2011). In comparison to the 1990s, when Australia's beer market was more or less dominated by three major breweries, today there are more than 150 craft breweries across the country with a growing interest and thirst for beers of new style and flavour (IBISWorld, 2015).

However, the distinction between craft beer and non–craft beer in Australia is becoming increasingly blurred due to several key acquisitions in the beer industry over the past five years. Craft beer brands such as James Squire, Matilda Bay and Little Creatures are wholly or significantly owned by Carlton & United Breweries or Lion, who jointly shares over 80% of the Australian beer market (IBISWorld, 2015). While most of the acquired craft breweries in Australia would be excluded from the US definition of 'craft beer' on that basis, we follow the Australian definition and consider the acquired companies as part of the craft beer industry. Whilst the relative size of the craft brewing industry is small with only 3.5 per cent of overall market share, it is projected to grow at an annual rate of over 6 per cent for the next five years (IBISWorld, 2015).

2.2 The Case for Sustainability in Breweries

As noted previously, the basic recipe for beer is relatively simple. Using water, hops, barley, and yeast, it is the multiple stages in the production cycle prior to delivering the final consumable product that present unique environmental challenges (Fish, 2015). Environmental issues associated with brewing include energy and water consumption, wastewater and solid waste, and greenhouse gas emissions. Energy consumption for brewing is relatively intensive in terms of



both electrical and thermal energy. Moreover, the brewing process involves high consumption of good–quality water in production, heating, cooling, cleaning packaging vessels, production machinery, cleaning of delivery vehicles, and sanitation. Furthermore, this generates a lot of liquid waste such as the weak wort and residual beer (Fakoya & van der Poll, 2013). In recent years, these challenges have been increasingly addressed by industry participants. While brewery managers traditionally focused on the improvement of production processes to reduce costs and increase the quality of beer, a shift towards more sustainable techniques to reduce environmental impact has been observed (Fillaudeau, Blanpain-Avet & Daufin, 2006; Koroneos et al., 2005). Moreover, breweries are beginning to partner with non-profit organisations to tackle environmental challenges and establish operational standards and guidelines for the industry as a whole. For example, in 2015 more than 42 beer companies from local microbreweries to major international brands in the USA signed a 'Brewery Climate Declaration' to integrate sustainability into their business practices (Ceres, 2015). The uptake of sustainable measures in brewing is also evident in Australia, where two of the largest beer manufacturers, namely Lion and SABMiller, have reacted to environmental concerns in the form of sustainability practices and reports. The craft beer industry posits itself as inherently sustainable through local ingredient sourcing, production, and distribution (Fish, 2015). Although macro and craft breweries can be regarded to have different approaches to sustainability, application of environmental impact measurement systems for both types is still in its infancy (Boden, 2012; Schaltegger et al., 2012). According to Cordella, Tugnoli, Spadoni, Santarelli and Zangrando (2008, p.139), there is a need for "monitoring, registering and analysing the input and the output streams of the brewery system; choosing carefully the suppliers, especially those of barley and glass bottle; improving energy saving policies; optimizing solutions for the product delivery; setting up marketing strategies in favour of reusable packaging rather than non-returnable ones". In other words, there is a need for breweries, in particular craft breweries, to incorporate sustainability practices and measurements systems during the brewing process in order to monitor water, waste and energy consumption.

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However, sustainability measurement processes in craft breweries are less developed (Hoalst– Pullen, Patterson, Mattord & Vest 2014). In large breweries, a significant proportion of the sustainability effort is put into monitoring and reporting activities. In the case of craft breweries, the extent to which the sustainability concept translates to daily business activities is minimal. In addition, data on sustainability practices of craft breweries is scarce, since only a few breweries publish sustainability reports (Bos-Brouwers, 2010). This lack of data can be attributed to inadequate resources, low degrees of formalization, lack of public visibility, and low reporting priorities of craft breweries (Lee, Herold & Yu, 2015; Sen & Cowley, 2013). Although sustainability and its practices can be linked to the broader concept of economic, social and environmental issues, this paper targets the environmental aspects of sustainability and focuses specifically on the brewing production process. Thus, the aim of this paper is to gain a better understanding of environmentally sustainable practices in Australian craft breweries and identify sustainability trends with a focus on water, waste and energy consumption.

3. The beer production process

Beer production is a multi–step process that includes three predominant stages: brewing, fermentation and processing. The resources used in the brewing process include raw materials such as grains, hops and yeast, water and electrical or thermal energy. This process can be regarded as having negative externalities occurring through the production of greenhouse gases, waste and the consumption of vast amounts of water (Hoalst–Pullen et al., 2014). The next subsection addresses the importance of sustainability in brewing under the auspices of water, waste, distribution and energy.

3.1 Water

Clean water is a necessary component for quality craft beer production. Water characteristics such as pH, alkalinity and hardness, which tend to vary by region, contribute to the taste and aroma of beer (Fish, 2015). Moreover, not only does water make up 85 to 95 per cent of beer's

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total volume, it is used in almost every step of the brewing process (Van der Merwe & Friend, 2004). Thus, the usage of water in brewing varies depending on factors such as the type of beer, the size of brewery, the process of washing, heating and cooling as well as the type of packaging (e.g. bottling consumes more water than kegging). The average water use ratio for a large commercial brewery is around four to seven litres of water per one litre of beer (Kunze & Manger, 2011). According to Schaltegger et al. (2012), brewery managers are often not fully aware of water–intensive processes such as "bottling". Their study showed that due to the bottling process comprising of multiple cleaning stages at different temperatures with detergents, brewery managers were unaware of the high water consumption that occurred during this stage. Many craft breweries receive their water from community suppliers after which community treatment plants purify up to 70 per cent of the returned water (Fish, 2015). Therefore another important point of influence on a brewery's water usage is the strength of its relationships with community water providers as they regulate and facilitate the brewery's water consumption.

3.2 Wastewater

The processing and disposal of wastewater can be regarded as the most visible environmental issue faced by craft brewers. Crucial parts of brewery wastewater are the solid wastes such as spent grains, hops, trub, sludge and surplus yeast. Despite the high organic matter and biodegradable content, the disposal of brewery wastewater into rivers or other public waters could facilitate plant, algae, and bacteria growth, leading to reduced oxygen levels detrimental to fish and other aquatic life (Fish, 2015).

Brewery processes also generate liquids such as the weak wort and residual beer which the brewery should reuse rather than allowing it to enter the effluent stream. The main sources of residual beer include processing tanks, diatomaceous earth filters, pipes, beer rejected in the packaging area, returned beer, and broken bottles in the packaging area (Olajire, 2012).



According to Kanagachandran and Jayaratne (2006), it is estimated that for every litre of beer approximately three to ten litres of waste effluent are generated, mostly from the brewing, rinsing and cooling process. The issue for craft breweries is that this water must be disposed of or safely treated for reuse, which is often costly and problematic. As a result, many brewers are today searching for ways to cut down on this water usage during the beer brewing process, and/or means to cost effectively and safely treat the brewery wastewater for reuse (Simate et al., 2011).

3.3 Energy

The brewing process is energy intensive both in electrical and thermal energy. Thermal energy is used to raise steam in boilers, which is used largely for wort boiling, water heating in the brew house, and in the bottling hall (Holden, 2011). The process of refrigeration is typically the largest single consumer of electrical energy, but the brew house, bottling hall, and wastewater treatment plant can account for substantial electricity demand. On average, the entire production process of brewing will consume 60 kWh for every 100 litres of beer produced, which can be regarded as a significant contributor of greenhouse gases (Olajire, 2012).

An increase in greenhouse gases will negatively impact many brewery operations by impacting breweries' water consumption, recycling, and solid waste disposal methods. Changes in temperature, precipitation, sea level, and the frequency and severity of extreme events will impact both future energy consumption and the availability of energy sources (Boden, 2015). Additionally, the quality of beer itself will be impacted as increasing temperatures and rainfall variability will change the growing geographies of hops and barley. These two crops that are highly dependent on specific growing conditions, will be more difficult to grow and harvest in light of a changing climate (Fish, 2015).



Large brewing operations are addressing and measuring their emissions from energy use and report their progress in sustainability reports (Bos-Brouwers, 2010). Craft breweries, who have viewed energy use and greenhouse gas emissions more as a function of cost than sustainability issue, are increasingly looking for ways to reduce energy levels.

Within the production process, craft breweries are also considering alternative energy sources, including solar power, wind power, biomass, and biogas, to mitigate environmental impacts (Fish, 2015). A recent development of craft breweries is the use of renewable energy. In particular, craft breweries see solar roof–tops as an opportunity to save energy and costs. Solar panels can not only be used to generate hot water up to 160–300°, but can also be used for heating processes for bottle washing machines, pasteurisers or cooling processes with absorption chillers (Weiss & Rommel, 2005).

In sum, despite the environmental challenges and the importance of integrating 'sustainability practices' in the craft beer industry, there seems to be a lack of willingness to generate metrics that would identify and measure sustainable performance during the beer production process. Moreover, the sustainability activities and practices that are used in the craft beer industry, particular in the Australian context are unclear. Thus, there is justification to explore sustainability practices in Australian craft breweries and to contribute to the body of knowledge in this emerging field.

4. Method

Based on the literature review, the most significant environmental sustainability challenges associated with the beer production process include water, waste, energy and emissions to air management. Currently, there is only limited academic knowledge about these sustainability challenges in the Australian craft brewing industry. Therefore, the research aim of this paper is to reveal current environmental sustainability practices and trends in Australian craft breweries



with a specific focus on three key issues: water consumption, waste generation and energy efficiency.

This paper adopts a document analysis approach to examine the current sustainability trends and practices in the Australian craft brewing industry. Document analysis represents an analytical method in qualitative research and is a widely used systematic procedure for reviewing or evaluating documents (written or electronic) in order to elicit meaning and to gain an understanding of a contextual issue (Corbin & Strauss, 2008). Whereas document analysis has served mostly as a complement to other research methods, document analysis of secondary data as a 'stand-alone' method can also be used in qualitative research studies to provide insight into a specific phenomenon (Bowen, 2009; Merriam, 1988; Wild, McMahon, Darlington, Liu, & Culley, 2010).

To address the research aim and reveal the current sustainability practices in Australian craft breweries, public documents from the beer industry and Australian craft breweries were analysed. The documents used for the investigation comprise two sources: first, sustainability reports from Australian craft breweries were reviewed. This included a search within the craft breweries websites for sustainability related activities. Second, apart from the craft brewery information and websites, sustainability-related information about craft breweries was collected through internet search, using the keywords 'sustainability', 'environment', 'water', 'waste', 'energy', emissions in conjunction with the words 'Australia', 'craft brewery', 'beer production' or a mix of those. The data collected from this search complemented the information from the sustainability reports and included information from non-profit organisations, business associations, media releases and press articles. These documents can be regarded to provide a comprehensive overview about the environmental sustainability data in the context of Australian craft breweries.



Any information that was found to be non-relevant (e.g. information about US-based craft breweries or sustainability processes outside the beer production process) was rejected. A final review of data uncovered the sustainability related areas which allowed categorisation of themes and an allocation to the specific areas of water, waste and energy.

5. Results and Discussion: Sustainability and Trends in Australian craft breweries

The findings identified the implementation of sustainability practices as one of the most effective means of improving capacity for compliance with environmental demands. For example, engagement in sustainability practices may result in reduced local pollution through burning less fuel, lower greenhouse gas emissions and reduced negative externalities (Olajire, 2012). Australian craft breweries have taken specific steps to reduce the environmental impact of water, waste and energy consumption.

5.1 Water

With the industry average to produce one litre of beer ranging from four to seven litres of water, there are a number of water mitigation strategies that craft breweries can implement as best practices. Australian craft breweries are increasingly installing water meters at various sections of the operation to reduce water consumption during the beer production process. Other methods include the reduction of water pressure on equipment spray nozzles, the control of water usage during the clean–up procedures and preventative maintenance (Boden, 2012).

Moreover, an increase in wastewater effluent regulations will be a significant driver of water reduction strategies. Reducing the quantity of water needed for the brewing process is beneficial in terms of both environmental impact and cost. Some craft breweries can also reduce water consumption by recovering water throughout the brewing process to be used in cleaning

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processes that do not require high quality water (Olajire, 2012). Another popular method to minimise water usage is the purchase of water restoration certificates. This ensures the restoration of water to streams using criteria that guarantees water quality, the survivability of native fish and wildlife populations, along with aesthetic and recreational improvements for those streams (Fish, 2015).

Interestingly, some craft breweries have achieved water consumption levels below the industry average resulting in about three litres per one litre of beer. The craft brewery 'Beard & Brau' in Tamborine (Queensland), has adopted a sustainable philosophy called 'from the land returning to the land'. By modifying their production processes, the brewery has been able to reduce the water usage to less than three litres per one litre of beer (Beard & Brau, 2014). A reduction in the amount of water consumed in a brewery has several environmental benefits, including conservation of water resources, and thus, lower wastewater volumes.

5.2 Waste

Breweries solid waste disposal impacts can be mitigated by both resource conservation and recycling. Examples to increase quality from liquid waste include craft breweries that utilise microbes to consume residual brewing biomass by pumping untreated wastewater into an on–site anaerobic digester. The microbes produce methane, which is then collected and converted into electricity used to brew beer. The leftover water is sent through an aerobic digestion process that leaves clear water behind (Fish, 2015). For solid waste, a popular method is to recycle the by– products of the brewing process as they can be utilised by businesses and individuals in various ways (Boden, 2012). Breweries today sell or donate spent grain to local farmers and livestock owners to be used as animal feed or compost, which results in less waste sent to a landfill and more sustainable local agricultural businesses.



However, minimising waste can also occur with the reduction of raw materials, which will not only result in cost savings, but will also reduce the environmental and financial costs of waste production and reduce the strain on natural resources (Olajire, 2012). Activities of Australian craft breweries include process changes, mill adjustments, installation of new mash filters and packaging modification such as the replacement of glass bottles with PET bottles. Some craft breweries, such as Murray from New South Wales, have developed their own eco–friendly 'take home beer systems', which enable customers to take home draught beer in refillable bottles that can be brought back and filled on numerous occasions (Murray Brewing, 2014).

'Mountain Goat' brewery uses a huge rainwater tank and neutralises their wastewater (King, 2015). The 'Australian Brewery' in Sydney has opted to can beers instead of bottling them. The canning process allows for savings in weight and material with a 92 per cent mass reduction compared to bottling and around 40 per cent less volume once final packaging is complete (Terlato, 2015). However, it is still unclear whether cans have a lesser environmental impact than bottles due to the mining of bauxite and smelting of aluminium in their production cycle (Fish, 2015). Redundant Breweries, a start–up craft brewer in South East Queensland, also notes waste reduction as a key priority.

5.3 Energy

Implementing energy conservation methods, in addition to utilising alternative energy resources, are two methods by which craft brewers can ensure the sustainability of their brewing operations. Increasing reliance on alternative energy sources helps to mitigate larger climate change impacts, which ensures the sustainability of critical craft beer resources such as hops, barley, and water. Measuring greenhouse gas emissions, using renewable energy, cutting energy use by recycling steam, capturing methane, cutting transportation emissions, and becoming LEED certified are just some of the actions that craft breweries are taking to reduce their environmental impacts.



In addition to conserving energy, breweries are looking to alternative energy sources to reduce environmental impacts. 'Mountain Goat' and the 'Australian' Breweries source more than 75 cent of their heating requirements from solar energy (King, 2015; Terlato, 2015). The 'FogHorn Brewhouse' in Newcastle invested in a roof that supports solar panels and features a 70kW solar energy system, designed to eventually deliver all 'FogHorn's' power. A further instalment of solar batteries will allow 'FogHorn' to run off-the-grid (NAB, 2015). Moreover, one natural advantage of craft breweries compared to larger breweries is their proximity to local communities, which results in lower transportation and logistics operations. 'Hop Nation', for example, sells most of their product within 20km of the brewery, significantly reducing transport emissions (HopNation, 2016). Ease of transportation of beer is not the only natural advantage of craft breweries. 'Murray's', a craft brewery in New South Wales, sources its ingredients from within 160km of their production site, which significantly reduces the transport and packaging footprint (Murray Brewing, 2014).

Other craft breweries save energy by recapturing steam that is lost during boiling and using the warm water collected during the heat exchange process to begin another brew (Bamforth, 2009). Capturing methane – a by–product of the wastewater treatment process and a potent greenhouse gas – can also be used to generate electricity and provides up to 15 per cent of electricity needs of craft breweries. An increasing number of craft breweries were seen to adopt environmental guidelines to scan their production process to unlock saving potentials. One possibility is the adoption of Global Reporting Initiative standards to measure greenhouse gas emissions and initiate specific product–related life–cycle analyses as well as the implementation and certification of LED for high–efficiency heating and cooling units (Ceres, 2015).

6. Conclusion – Don't Waste An Opportunity

The literature suggests that Australian craft breweries have been extremely proactive in implementing sustainable brewing methods. The implementation of sustainable practices has the

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potential to reduce costs, water usage, waste creation and energy consumption. Through sustainable process, some Australian craft breweries have been able to reduce their water usage, to less than half of commercial breweries intake. Moreover, the implementation of monitoring systems for water as well as simple 'housekeeping' measures such as the identification and a timely repair of leaks can effectively reduce operating cost and enhance competitive edge for a relatively small investment. For waste reduction, craft breweries increasingly rely on process changes within the brewery process and own bottle and 'home beer' systems. The reduction of air emissions and energy is also on the agenda of Australian craft breweries, where an increasing amount of craft breweries switches to alternative energy sources such as solar panels on the roof, which provide up to 75 per cent of the heating requirement.

However, the results of the analysis must be viewed in the light of its limitations. This paper used only secondary data from available public sources. Thus the data collection and analysis is inherently subjective, as it relies mainly on information from Internet research. Despite these limitations, the results can be used to support further research. To examine sustainability practices in the craft beer industry, future research may include case studies and or interviews with the owners of craft breweries. Moreover, the effectiveness of sustainability practices can be examined and comparative case studies can be used to measure the effectiveness. As consumers place an increasing value on knowing where products come from and how they are made, breweries are under pressure to implement sustainable best practices. A focus on sustainability can result in a competitive advantage over less efficient companies and allow craft breweries to increase their profits at current product prices, or lower their prices to gain market share. Thus, craft breweries can ensure sustainable best practices while promoting Australia's craft beer industry by both protecting and capitalising on local natural resources as well as continuing to remain aware of their impact on the environment. Therefore, the impact of the craft beer boom becomes less about its environmental effects but rather how craft breweries are demonstrating that an entire industry can effectively reduce its environmental impact.

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Effects of Role Models on Developing Entrepreneurial Intention among Graduate Students in Tunisia

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Abstract

The current paper analyses the effect of role models on the development of entrepreneurial intention among graduate students in Tunisia. To capture students' responses regarding their perception about the link between role models and entrepreneurial intentions, a questionnaire survey was distributed to a sample of 180 students enrolled in three higher institutions in Sfax-Tunisia.

Our findings suggest that students' entrepreneurial intentions are developed through business contacts with already established organizations and firms. Besides, our results signaled the eminent role of parents, family, and reference group in fostering Tunisian students' inclination to start their businesses. Although abundant literature treated the issue of determinants of

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entrepreneurial intentions among students in developing countries, little research has been conducted on the effect of social networks on developing students' entrepreneurial intentions. This paper addresses this issue with a particular emphasis on the prominence of role models.

1.Introduction

The evolution of the concept of entrepreneurship has yielded a variety of nuances regarding its definition which is characterized by its being sensitive to the openness of modern social, political and economic systems. These requirements might help capturing a more operational definition which highlights human behaviors as indicators of entrepreneurial events, which are, in turn, characterized by creativity, innovativeness, and competitiveness. In fact, innovation is the hallmark of entrepreneurship since it heavily relies on transforming ideas into economic opportunities. This view reinforces the fact that entrepreneurial and innovative people who are able to exploit opportunities and willing to take risks contribute to economic progress and national welfare (Tang *et al.*, 2012).

The current article proposes to apply Ajzen's (1991) Theory of Planned Behavior (TPB), accounting for the antecedents of entrepreneurial intentions (individual attitudes towards an act, subjective norms, and perceived behavioural control), and Shapero and Sokol's (1982) model of the Entrepreneurial Event (SEE), accounting for entrepreneurial behavior. In this respect, the fact that people having less prospects of being employed in established organizations and the fact that having fewer chances for getting salaried jobs are considered as the most contributing factors driving individuals to seek opportunities for self-employment. These incentives allow for the creation of new businesses that contribute to the development of national economies (Kuratko, 2005).

Despite the multiplicity of efforts to universalize management research, some problems are still worth investigating. In the light of the theory of planned behavior (TPB) and entrepreneurial

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event (EE), we translate the phenomenon of students' entrepreneurial intention into a problem related to the effects of role models on developing individuals' entrepreneurial tendencies. Thus, our aim is to respond to the following question:

What are the effects of role models on shaping entrepreneurial intentions among graduate students in Tunisia?

The main objective of the current article is to generate students' intention by disseminating the entrepreneurial spirit. In fact, the concept of intention has been used to predict behavior, to understand the process of forming the intention and finally to assess the impact of factors influencing business start-ups among individuals.

2. LITERATURE REVIEW

Researchers, such as Bird (1988), Ajzen (1991) and Gelderen *et al.* (2008), perceived an entrepreneurial intent as the inclination to start a business with a focus on one's likelihood of possessing a business. For Ajzen (1991), an entrepreneurial intention is the quest for information that serves the fulfillment of venture creation. In this sense, intentions are immediate antecedents of individuals' behavior that indicates their readiness of being engaged in self-employment activities rather than seeking jobs in established organizations. For Bird (1988), intention is a state of mind that focuses on a person's attention, experience, and behavior which are targeted towards a specific object or behavior.

So, once individuals feel inclined to start their own business, their behavior is regarded as a purposive one. Intention towards this purposive behavior is maintained to be as a key factor that determines the ultimate phase of what a person has already intended to perform (Gelderen *et al.*, 2008).

Therefore, according to Krueger *et al.* (2000), both models, (TPB and SEE), provide comparable interpretations of entrepreneurial intentions. So, perceived behavioral control in TPB

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corresponds to perceived feasibility in the SEE model. Then, attitudes and subjective norms in the TPB model are conceptually related to perceived desirability in SEE. On this basis, perceived desirability and perceived feasibility are vital elements contributing to the conception of intentional behavior. In this sphere, for Kolvereid (1996), attitudes are both beliefs and perceptions which are related to personal expectations resulting from one's desirability in becoming an entrepreneur.

In fact, various studies conducted on entrepreneurship have shown a positive relationship between attitude and behavioral intention (Krueger *et al.*, 2000; Souitaris *et al.*, 2007; Gelderen *et al.*, 2008).

What is worth signaling is the fact that the intended act of business creation and enterprising can result from unconscious antecedents. This reinforces Bird's (1988) assumption which highlights that intentionality is a state of mind which directs individuals' attention to act in accordance with the aim to realize the goal of indulging into the realm of entrepreneurship. Gelderen *et al.* (2008) argued that the prominence of entrepreneurial intentions stems from the fact that they are planned and can be developed over time. Therefore, the entrepreneurial intention occupies a pivotal position in determining individuals' propensity to found their own businesses.

The current paper focuses on the effects of role models on the development of entrepreneurial intentions among graduate students in Tunisia.

3. Role Models Affecting Entrepreneurial Intention

3.1 Effects of established organizations on developing entrepreneurial intention

Although the organization has not existed yet and has remained just an idea in the cognition of potential entrepreneurs, it is assumed to determine the entrepreneurial intention of business creators. So, established organizations serve as incubators for new companies. Hence, the

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conceptualization of a business opportunity drives potential entrepreneurs to develop the initial business activity to be undertaken. On this basis, an already existing organization where entrepreneurs have already started their own firms may stimulate employees to imitate them (Shane, 2003). Then, employees who have already become entrepreneurs are also expected to encourage other employees to indulge into the realm of entrepreneurship. In this sense, being at the intentional stage, prospect entrepreneurs have to take into account their goals as well as the organizational environment in which their future business may operate. Hence, the organization is expected to play a relevant role in fostering individuals' entrepreneurial intention. Thus, literature on this attitudinal element regarding the influence of the organization on individuals' entrepreneurial perception has enabled us to issue the following hypothesis: *Hypothesis (H1): established organizations are positively linked to the development of entrepreneurial intention among graduate students*.

3.2 Effects of parental role model on developing entrepreneurial intention

Parents are supposed to have the strongest impact on their children's attitudes, intentions and knowledge as they have the closest and longest contacts with their family members. Thus, members who grow up in an entrepreneurial environment that offers the opportunity to learn from self-employed parents can benefit a lot from them as a role model providing a realistic view of self-employment (Muller, 2006). On this basis, entrepreneurial role models within the family are unique sources of tacit knowledge about business strategy and entrepreneurial decision making (Shane, 2003).

So, the information and skills necessary for decision-making are typically not available in codified form and in real time, nor are they abundantly available in educational institutions. As such, the possession of tacit knowledge about entrepreneurial decision making is of enormous value for the ability to exploit an opportunity (Shane, 2003). Hence, the most natural way to

acquire such tacit knowledge is through observation of others, in particular parents and close friends.

In the same vein, Davidson (1995) maintained that a large number of business creators have close role models that have stimulated them to start their own businesses. These people rely on the involvement of their parents in entrepreneurial activities. This makes them inclined to express their intentions to become entrepreneurs in the future (Bird, B. 1988).

Therefore, the relationship between parental role model and individuals' intention to start their own projects is translated into the following hypothesis:

Hypothesis (H2): parental role model is *positively related to graduate students' entrepreneurial intentions.*

3.3 Effects of Familial role model on developing entrepreneurial intention

Family members, known also as relatives, also may serve as role models since individuals find it beneficial to contact them so as to acquire information related to the needed entrepreneurial skills and knowledge (Fairlie and Robb, 2005). These individuals are expected to be well-equipped with some kind of training and illuminated with apprenticeship to develop their own taste of self-employment in the near future. In fact, a great deal of research supports the view of family influence on their members' subsequent behavior (Hoge *et al*, 1982). In this context, research demonstrates that parental work experiences have significant effects on their children. These effects are, therefore, internalized as norms of behavior within these children's cognition for a future use (Menaghan and Parcel, 1995).

Similarly, Bruderl and Preisendorfer (1998) maintained that knowledge and good advice received from strong network ties can be more useful, reliable and exclusive than information gained from formal sources. In this sense, prospective entrepreneurs who can rely on support in

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terms of knowledge and good advice from family members or friends can acquire knowledge about managerial and business processes, and also about market prices which are not available elsewhere (Evans and Jovanovic, 1989). Such knowledge is expected to provide these individuals' new venture a competitive advantage and a better chance of business survival. In the same vein, prior family business exposure can be perceived as an intergenerational influence agent and serves as a mechanism whereby "... the within-family transmission of information, beliefs, and resources..." occurs (Moore *et al.*, 2002).

In short, literature on family business and family role model supports this contention assuming that early exposure to entrepreneurship and experience in the family business can affect the family members' attitudes and intentions towards entrepreneurial actions (Fairlie and Robb, 2005).

Therefore, the relationship between familial role model and individuals' intention to start their own businesses is translated into the following hypothesis:

Hypothesis (H3): familial role models are *positively related to individuals' intention to launch their own projects.*

3.4 Effects of reference group role model on developing entrepreneurial intention

In collectivist societies and within a cultural grouping system, members express a degree of loyalty to their surrounding since they are constantly looked after by their relatives and friends. The prominence of this cultural dimension lies in the fact that some members represent a fundamental form of social organization and are considered as a dominant form of enterprise and a support network (Hofstede, 2001). They contribute in decreasing the costs of business operations and facilitate the business take-off as they do not economize their energy, but work on pooling resources for start-ups. Hence, prospect entrepreneurs imitated role models of close

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relatives and feel likely to acquire information from their social networks (Brüderl and Preisendörfer, 1998; Sequeira et al., 2007).

Therefore, literature on role models revealed that the element of reference group, as a social network system, plays a crucial role in fostering members' entrepreneurial intention and in reinforcing their likelihood to the realm of entrepreneurship. So, the relationship between reference group and individuals' intention to start their own businesses is translated into the following hypothesis:

Hypothesis (H) 4: reference group is *positively related to individuals' intention to launch their* own projects.

Figure 1 illustrates a conceptual framework relating to the effects of role models on Tunisian graduate students' entrepreneurial intentions.

3. Research model and methodology

3.1. Research model

To evaluate the causal relation between the independent factors and the propensity to start a business, we have formulated four hypotheses that are applicable to our research paradigm (i.e., role models) as indicated in our conceptual framework (Figure 2 above). Now that the conceptual framework is built and the hypotheses are formulated, we will deal with the sampling method and display the procedures of data collection to measure the existing relation between our set of variables and the intention to start a business.

3.2. Regression model and variables' measures

The simultaneous influence of all explanatory metric variables on entrepreneurial intention is tested through multiple regression. This is an extension of the simple linear regression involving several independent variables. The objectives of the multiple regression are broadly the same as

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the simple regression. First, it serves to explain variations in the dependent variable from those of many independent variables assumed to be the cause of these variations. Second, the purpose is also to determine the intensity of this relationship.

Finally, compared to the simple regression, the multiple regression offers the advantage of analyzing the contributions of each explanatory variable when interpreting the phenomenon.

INTEN =
$$\alpha_0 + \alpha_1$$
ORGANI + α_2 PRAT + α_3 FAMIL + α_4 REFER + ε_{it}

with :

- **INTEN:** intention to create a business
- **ORGANI:** organizational role model
- **PRAT:** parental role model
- **FAMIL:** familial role model
- **REFER:** reference group role model
- -

3.2. Sample

The participants were 180 students enrolled in three higher institutions in Sfax-University, Tunisia: FSEG, ESC, and ISAAS. The respondents were classified as follows: 22 third-year students in Business Administration License program, 37 third-year students in Management License program, 26 students in Business Administration Master program, 31 in Banking and Insurance Master Program, 28 in Financial Engineering Master program, and 36 students in entrepreneurship Master program.

Students are often used to assess their intention models because it is relatively easy to collect data from them. Then, there is a greater probability that young people will have entrepreneurial intentions and are longing for starting their own businesses (Krueger *et al.*, 2000). Before starting the homogeneity tests which are necessary to validate our hypotheses, it is appropriate to focus on the description of our sample and to specify the properties of the collected data. Thus, we describe the characteristics of our sample through the following

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variables: gender, age, level of education, and previous working experience. Table 1 below is illustrative.

It follows from Table 1 above that 54.45% of potential business creators' age ranges between 23 and 25 years. While the proportion of entrepreneurs whose age is less than 25 years is 38.33%, which explains the degree of risk aversion for this deemed inexperienced age group. The proportion of potential entrepreneurs whose age is above 28 years is very weak (7.22%), indicating that students are seeking to found their own projects as soon as they become graduated. Besides, 67.22% of students aspiring to become entrepreneurs are Master students. This also explains the visionary strategy of Tunisian authorities to promote youth entrepreneurship after graduation.

3.3. Data analysis

In this study, we have applied the technique of principal components analysis (PCA) for the explanatory variables: organizational, parental, family, reference group and also for students' intention as a dependent variable.

The resolution procedure identifies the factor axes to calculate the variance associated with them and the factor contributions of each item. The dimensionality is based on factor analysis. The possibilities that the principal component analysis (PCA) provides the purification and validation of scales is one of the most used descriptive methods (Evrard *et al.*, 1997; and Igalens and Roussel, 1998). This method must be established beforehand to calculate reliability. The PCA identifies (the) dimension (s) of a constructed variable by identifying a priori the underlying(s) factor(s) of its scale.

The PCA is a method of data reduction that selects among the initial variables (items) those mostly involved in the description of the phenomenon. Thus, we obtain composite variables

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(factors) among which only the initial variables which are highly correlated with the considered most important factors are kept for testing the validation of hypotheses.

4. Analysis and Results

4.1 Checking the conditions of application and quality of the regression model

The verification of conditions for the application of multiple linear regression was performed by SPSS (21.0 version) under windows. These conditions relate to the linearity of the model and the normality as well as the homoscedasticity of residuals. The absence of bivariate and multivariate multicollinearity is also verified.

The empirical results show that 71.3% of entrepreneurial intention is explained by organizational, parental, family and reference group role models. The Fisher (F) statistics confirms the good quality of the model (F = 71,283 and sig. = 0.000). We can conclude that the model is statistically significant and is illustrative of the phenomenon. Regarding the significance of the independent variables, we see that all variables are statistically significant.

Table 2 below shows the explanatory power of the model, the beta coefficients, the t Student, the F statistic and its meaning, and a summary of the regression results on the set of explanatory variables of this model.

4.2. Analysis of the effect of organizational role model on entrepreneurial intention

The first hypothesis (H1) serves to test whether the organizational role model positively influences the entrepreneurial intention. Examination of statistical tests shows that this variable has a positive and significant effect on the development of entrepreneurial intention. Indeed, examination of causal relations shows that the coefficient associated with the link between organizational role model and entrepreneurial intention is positive (0.239) and is statistically

significant (the associated t value is 3.299, p = 0.001). This corroborates the predictions of the hypothesis (H1).

These results indicate that the organizational role model, which is embodied in having business contacts with other entrepreneurs, has a positive impact on potential business creators' decision to launch their projects (Gnyawali and Fogel, 1994). This can be explained by the fact that Tunisian young entrepreneurs, when attempting to launch their own projects, feel that they are in need to keep in touch with entrepreneurs who are already established in the market. These entrepreneurs are expected to provide them with knowledge about the needed business and managerial skills related to the running of their projects (Klapper, 2004). Thus, our findings corroborate literature on organizational role model as a motivational determinant for young entrepreneurs to found their business and to concretize their entrepreneurial endeavor.

4.3 Analysis of the Impact of parental role model on entrepreneurial intention

The second hypothesis (H2) states that parental role model positively impacts the development of entrepreneurial intention among business creators. Examination of statistical tests shows that this variable positively and statistically influences the development of entrepreneurial intention among graduate students.

Examination of the causal effect shows that the statistical coefficient associated with this variable has a positive value (0.324) and is statistically significant (the value of t is 3.816, p = 0.000).

This means that the variable of parental role model has a positive and significant effect on the development of entrepreneurial intention. Thus, we can conclude that parents can play a positive and significant role in fostering their decision to create a business, which confirms hypothesis (H2).



Therefore, our results corroborate other studies on parental role models as an element capable of determining entrepreneurial intentions among nascent entrepreneurs (Muller, 2006). Similarly, Carr and Sequeira (2007) and Gelderen *et al.* (2008) found out that parental occupation significantly contributed to the prediction of entrepreneurial intention. In this sense, children who grew up in an entrepreneurial environment, and mainly with entrepreneurial parents, had the propensity to be self-employed. In the same token, Herrington and Kew (2014) found out that parents traditionally wish to expose their children to the line of their occupation to enable them to better understand the prerequisites of self-employment and make it easier for them to aspire to engage in similar business activities.

4.4 Analysis of the impact of family on entrepreneurial intention

The third hypothesis (H3) is used to check whether family positively influences the development of graduates' entrepreneurial intention. Examination of statistical tests shows that this variable has a positive and significant effect on their entrepreneurial intention.

Indeed, examination of causal relations shows that the coefficient associated with the link between the role of the family and the entrepreneurial intention is positive (0.298) and is statistically significant (the value of t is 3.507, p = 0.001). This corroborates the predictions of hypothesis (H3).

So, our findings are in agreement with research on the effect of family as a role model on individuals' decision to become entrepreneurs. For instance, Sequeira *et al.* (2007) and Franco *et al.* (2010) assume that attitudes towards the realm of entrepreneurship which are developed by parents, family, friends, and role models are among the eminent triggers of business creation. According to Menaghan *et al.* (1995) and Hofstede, G. (2001), these conditions are proven to offer unlimited possibilities to individuals to delve into business creation. Similarly, Acs et al. (2009) assume that members characterized with entrepreneurial endeavors are in continuous

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quest for information from the family which may be seen as an important source of tacit knowledge helping its members to develop their likelihood to entrepreneurial activities.

4.5 Analysis of the impact of reference group on entrepreneurial intention

The fourth hypothesis (H4) is used to assess the extent to which reference group positively influences the formation of the entrepreneurial intention among graduate students. Examination of statistical tests shows that this variable has a positive and significant effect on the development of entrepreneurial intention.

Indeed, examination of causal relations shows that the coefficient associated with the link between reference group and entrepreneurial intention is positive (0.210) and is statistically significant (the value of t is 4.124, p = 0.000). This corroborates the predictions of hypothesis (H4).

Thus, our findings are fine-tuned with literature on reference group as a push force fostering their intentions to launch their projects. For instance, Kim Kleyver (2007) found out that involvement of reference group when one intends to start his or her business contributes to the development of entrepreneurial inclinations among potential entrepreneurs, and subsequently to the emergence of new enterprises. Similarly, Altinay *et al.* (2012) assume that peers can have up to three times much impact on the probability of individual entry into entrepreneurship as compared with individual's own attitudes. According to Bonte *et al.* (2009), peer groups who are already running their own businesses try to provide potential entrepreneurs a comfortable environment in their business start up phase. Thus, the fact that peer group is a prominent element of social interaction influencing individuals' decision to launch their projects sustains the eminent role of reference group in developing students' entrepreneurial intention.

5. Conclusion and Perspectives

In the current paper, we have investigated how role models contribute in shaping graduates' decision to launch their own businesses. With reliance on the theoretical and empirical studies, we have grouped role models into four sub-elements (organizational, parental, familial, and reference group) in connection to entrepreneurial intention. Thus, we have displayed four hypotheses to assess the extent to which they corroborate with the respondents' perceptions and, subsequently, with previous findings.

A randomly selected sample of 180 youth entrepreneurs were used to assess the extent to which role models can have an influence on students' intentions to become entrepreneurs. Our results were significant in the sense that our hypotheses received support and our findings were fine tuned with previous research on determinants of entrepreneurial intentions among potential business creators. Thus our paper has stepped into individual factors affecting entrepreneurial intentions, which .takes us some steps towards understanding how role models shapes potential entrepreneurs' inclination to become entrepreneurs.

Accordingly, the investigation has revealed that individuals with relatively large business networks are more likely to get access to information and valuable resources, which enhances their likelihood to the field of entrepreneurship and raises their tendency to identify entrepreneurial opportunities.

The study further shows that individuals who are embedded in entrepreneurial networks, notably the entrepreneurial role models as sources of tacit knowledge, have a positive impact on entrepreneurial intentions.

Our results concerning the effects of role models (i.e., organizational, familial, parental, and reference group) add important new insights on the role of close ties information providers.

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Hence, the hybrid of these elements serves to give a thorough picture about the eminent influence of role models, embodied in intricate and keen relationships, on shaping entrepreneurial intentions among prospect business creators.

In this sense, this paper empirically contributes to the existing research in the field of business creation, which allows for bridging the gap existing between entrepreneurial theoretical frameworks and the poor institutional and individual investment in this field.

Therefore, sensitizing business creators of the need to acquire information from peers and experts in entrepreneurship can better enhance their tendencies to concretize their own projects. So, raising potential entrepreneurs' awareness of multiple factors contributing to the development of their entrepreneurial endeavor may also serve to ascertain the rate of success and sustainability of new ventures.

6. Managerial implications and recommendations

The results of our analyses reveal that factors related to entrepreneurial role models are triggering graduate students' decisions to enterprise in Tunisia. Thus, the hybrid of elements related to the entrepreneurial role models serves to raise potential entrepreneurs knowledge about processes related to business start-ups.

Therefore, to improve their tendencies to subscribe in the realm of entrepreneurship as a career choice, prospect entrepreneurs are called to get more knowledge from their peers so as to better exploit entrepreneurial opportunities and achieve the stage of concretizing their business ideas with a lesser degree of risk and failure. Similarly, potential entrepreneurs should go beyond the intentional stage and delve deeper into the field of entrepreneurship with a spirit of innovation, competitiveness, and creativity.



Finally, apart from the eminent positive influence of role models on shaping individuals' entrepreneurial intentions, prospect entrepreneurs should have access to support systems that are instituted to provide better business and managerial trainings, which ought to encourage youths to register in undertaking business activities.

6. Limitations and perspectives

Despite the important findings, the present paper is limited to the perception of Tunisian graduate students about the effect of role models on their entrepreneurial intentions. However, our findings cannot be generalized to all Tunisian business founders since students from other areas of the country may have relatively distinct entrepreneurial perception of the need and the effect of role models on shaping their intention to enterprise. Besides, the study was limited to students as potential entrepreneurs, which does not reflect a common judgment since there exists a certain number of students who are not concerned with launching business at all. Finally, investigating young entrepreneurs who have already experienced the fact of launching business may yield more concrete results.

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Figures :

| Research | Opertionalization of | |
|--------------------|----------------------|-------------------------|
| paradigm | variables | [] |
| | Organisational | Intention to start a |
| Role Models | Parental | business |
| | Familial | |
| | Reference Group | |

FIGURE 1: DETERMINANTS OF ENTREPRENEURIAL INTENTIONS IN TUNISIAN CONCEPTUAL FRAMEWORK





Tables :

Table1: Respondents' demographics

| | | Total | Percentage |
|------------|-------------------|-------|------------|
| Gender | Male | 106 | 58.88 |
| | Female | 74 | 41.12 |
| Age Groups | 20-22 | 69 | 38.33 |
| | 23-25 | 98 | 54.45 |
| | 26-28 | 13 | 7.22 |
| Level of | License | 59 | 32.78 |
| Education | Master | 121 | 67.22 |
| Working | No experience | 56 | 31.12 |
| Experience | More than 1 Year | 112 | 62.22 |
| | More than 2 Years | 12 | 6.66 |

Table 2: Results of the multiple linear regression model

| Explanatory Variables | Coef. | T- Student | Sig |
|-----------------------|-------|------------|----------|
| Constant | | 3.615 | 0.000** |
| Organisational | ,239 | 3.299 | 0.001*** |
| Parental | ,324 | 3.816 | 0.000*** |
| Familial | ,298 | 3.507 | 0.001*** |
| Reference Group | ,210 | 4.124 | 0.000*** |
| $R^2 = 0.713$ | | | |
| R^2 ajusted = 0.703 | | | |
| F = 71.283 Sig. 0.000 | | | |