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The Dynamism of Entrepreneurial Motivation: A Case of Academic Entrepreneurs in a Resource Constrained Environment

L. Ranmuthumalie de Silva
Abstract
The aim of this paper is to investigate the dynamism of the motivations of academic entrepreneurs, who are operating in resource constrained environments. In-depth interviews are carried out to gather longitudinal data to investigate dynamisms, which are compared and contrasted with static motives identified from cross-sectional data gathered via an on-line survey. Findings reveal that academic entrepreneurial engagement is a process, which starts by engaging in teaching related academic entrepreneurial activities, and then diversifies into research related academic entrepreneurial activities and company creation. Since environment is resource constrained, the engagement in each type of activity is motivated initially by push factors, subsequently by pull factors, and during the shift by a combination of pull and push factors. These findings resolve the presence of two contradictory viewpoints in relation to static motives; namely, entrepreneurs being motivated by one type of motive (i.e. push or pull motive), and a mix of both types (i.e. pull and push motives), which is found to be determined by the stage at which cross-sectional data is collected. Therefore, this study highlights the importance of studying dynamisms to obtain an in-depth understanding about entrepreneurial motivations. Policy implications and future research avenues are discussed.

Keywords
Academic entrepreneurship, pull factors, push factors, entrepreneurial motivation, dynamism, resource constrained environment, low income countries

JEL Classification

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1. Introduction

In recent years, there has been increasing interests towards investigating what motivate academics to engage in entrepreneurial endeavour despite experiencing a reward system that mainly encourages publications, a culture that is considered to be different from industry (Jones-Evans 1997), and academic duties which tend to conflict with entrepreneurship (Wright et al. 2004). However, prior research has mostly investigated motives to form spin-off companies (Morales-Gualdrón et al. 2009, Prodan and Drnovsek 2010) even though academics often engage in a wide array of academic entrepreneurial activities (Jones-Evans 1997). The engagement in diverse entrepreneurial activities by academics has been found to be a process, which starts with carrying out less entrepreneurial activities, and then diversifies into more entrepreneurial activities (Tijssen 2006). Even though, the motivation of entrepreneurs has been found to vary along entrepreneurial processes (Shane et al. 2003), most of the prior research has investigated only the static motives of entrepreneurs. Hence, understanding the dynamism of entrepreneurial motive, and positioning it in the literature on static motives still remain as a research gap in both the entrepreneurship and academic entrepreneurship literature. Therefore, this research intends to investigate how the motivations of academic entrepreneurs change along their entrepreneurial careers.

It has also been mentioned in the entrepreneurship literature that the motivations of entrepreneurs who operate in high income countries vary widely from those in low income countries (Bosma and Harding 2006). Low income countries have been found to face relatively high levels of human (Alexander and Andenas 2008, Griffith-Jones et al. 2003), financial (United Nations Human Settlements Programme 2005), infrastructural, technological (World Bank 2010), and institutional (Claude and Weston 2006) resource scarcities. Some even argue that the significance of individual motive is higher in such resource constrained environments (Erdős and Varga 2009). Hence, it will be interesting to investigate what motivates academics in relatively resource constrained environments to engage in entrepreneurship. Accordingly, by amalgamating two main research gaps mentioned above, this research is aimed at investigating the dynamism in the motives of academic entrepreneurs who are operating in resource constrained environments.
2. Theoretical Context

Motivation can be defined as a cognitive decision making process through which goal directed decision making behaviour is initiated, energized, directed, and maintained (Huczynski and Buchanan 2007, pp. 244). The motives of entrepreneurs have been found to play critical roles in the process of entrepreneurship by identifying and capitalizing on opportunities (Shane et al. 2003, Ambos et al. 2008). The entrepreneurship literature categorises motives into two major types namely, ‘pull’ and ‘push’. ‘Push’ motives are the elements of necessity in which entrepreneurs are ‘forced’ to start a business to overcome negative external influences. In contrast, ‘pull’ motives are the attractive reasons why entrepreneurs decide to form new ventures (Gilad and Levine 1986). Table 1 illustrates pull and push motives identified in the academic entrepreneurship and general entrepreneurship literature.

Table 1: Pull and Push Motives of Academic Entrepreneurs

<table>
<thead>
<tr>
<th>Pull Motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In order to achieve career development (McClelland 1961, Greenbank 2001)</td>
</tr>
<tr>
<td>2. In order to acquire new knowledge and skills (Howell et al. 1998, Meyer-Krahmer and Schmock 1998)</td>
</tr>
<tr>
<td>3. In order to capitalise on the opportunity perceived by academic by him/herself (Basu and Goswami 1999, Shane and Venkataraman 2000)</td>
</tr>
<tr>
<td>4. In order to capitalise on the opportunity perceived by the university (Basu and Goswami 1999, Shane and Venkataraman 2000)</td>
</tr>
<tr>
<td>5. In order to provide a service to students (e.g. lab equipments industry placements employment opportunities and other opportunities for students etc) (Van Dierdonck and Debackere 1988, Meyer-Krahmer and Schmock 1998, Siegel et al. 2004)</td>
</tr>
<tr>
<td>6. In order to make use of industrial resources (Howell et al. 1998) (Meyer-Krahmer and Schmock 1998)</td>
</tr>
<tr>
<td>7. Desire for wealth (Hisrich and Brush 1986)</td>
</tr>
<tr>
<td>8. For personal satisfaction (e.g. associate with people outside the university, and independence, social status, challenge seeking nature etc) (Turnbull et al. 2001, Lumpkin and Dess 1996, Sexton and Bowman-Upton 1985)</td>
</tr>
<tr>
<td>9. As result of role models (Dunn and Holtz-Eakin 2000, Erdis and Varga 2009)</td>
</tr>
<tr>
<td>10. Belief that it will not interfere with academic career (Ambos et al. 2008)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Push Motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Job related dissatisfaction (Alstete 2002)</td>
</tr>
<tr>
<td>3. Not having an industrial partner capable of commercializing the new product/technology (Eun et al. 2006)</td>
</tr>
<tr>
<td>4. Lack of resources within university (Phan et al. 2005)</td>
</tr>
<tr>
<td>5. Pressure for academics to engage in entrepreneurial activities (Van Dierdonck et al. 1990)</td>
</tr>
</tbody>
</table>
Cross sectional studies carried out to investigate the motivations of academic entrepreneurs (i.e. static motive) have produced two seemingly contradictory viewpoints. One perspective argues that academics are motivated by one type of motive (i.e., either pull or push), while the other believes that academics are motivated by a mix of pull and push motives. The standpoint which argues that academic entrepreneurs are significantly motivated by one type of motive (i.e. either pull or push) has found that they are mainly motivated by pull factors. For example, Smilor (1990), in a study of 23 technology-based spin-out companies from the university of Texas at Austin, concluded that academics are more highly motivated by pull factors in comparison to push factors. The pull factors identified were the recognition of a market opportunity, a drive to try something new, and a desire to put theory into practice. Insufficient income has been the only push factor found to be of importance.

Considering the effect of one type of motive, Amit and Muller (1995), in the general entrepreneurship literature, categorised entrepreneurs as ‘pull entrepreneurs’ and ‘push entrepreneurs’. Moreover, Hessels et al (2008) stated that entrepreneurs who are motivated by push factors are unlikely to make a great economic contribution, and thus, suggested that policy makers should discourage entrepreneurship which is driven by push motivation.

The above described significant effect of one type of motive (i.e., pull or push) has been further extended by relating it to the context in which entrepreneurs operate. For example, Wright et al (2004) concluded that spin-off formation in the Massachusetts Institute of Technology or the University of Stanford is motivated by pull factors due to the high level of innovation in the surrounding region, while it is often ‘technology push’ in an environment with less innovation and entrepreneurship. Similarly, in the Global Entrepreneurship Monitor (GEM) project (2006), the majority of entrepreneurs who are motivated to capitalize on perceived business opportunities (which is a pull motive) were found in high income countries, while those who were motivated by necessity (which is a push motive) were found in middle or low income countries (Bosma and Harding 2006). This was further supported by Acs (2006) who revealed that the higher economic development, the higher the ratio of opportunity to necessity entrepreneurs.

However, the second viewpoint argues against the above discussed significant effect of one type of motive. For instance, Weatherston (1993), by studying UK academic entrepreneurs, stated that it is a combination of pull and push motives that affect their engagement. Job related dissatisfaction, a need to financially support the activities of university departments,
and a desire to improve personal income were the major push factors and personal satisfaction was a pull factor identified in his research. Balázs (1996) also theoretically argued that both pull and push factors govern academic engagement in spin-off formation. The findings of Morales-Gualdrón et al. (2009), in a survey administered to 152 Spanish academic entrepreneurs, also supported the combined impact of push and pull motives. This was further endorsed by several authors in the general entrepreneurship literature (Snyder 2004, Williams 2008, Tagiuri and J. 1992, Tagiuri and Davis 1992). For example, Brush (1990) stated that the situation is rarely a clear cut selection of whether ‘pull’ or ‘push’ factors have driven entrepreneurs, and that factors are often combined. Similarly, Tagiuri and Davis (1992) also highlighted that entrepreneurs are motivated by multiple motivating factors rather than one single overarching factor.

Even though the above stated dichotomous views, which were mainly derived from cross-sectional data, seem contradictory, if the dynamic impact of motivation is taken into account, both the views could be accepted. Shane et al. (2003) have suggested that entrepreneurial motive could vary according to the stage of entrepreneurial process. Similarly, Schjoedt and Shaver (2007), in their research in the US, revealed that entrepreneurs who are in their early careers (i.e., nascent entrepreneurs) are significantly motivated by push factors in comparison to other types of entrepreneurs. Relating the context to changes in entrepreneurial motive, it has been argued in the literature that, in an extremely constrained environment, entrepreneurs are initially pushed to engage in entrepreneurial activities, but with the development of their business, motives gradually change towards pull (De Silva and Kodithuwakku 2011; Rosa et al. 2006). These arguments led to believe that entrepreneurs operating in relatively resource constrained environments may be motivated initially by push factors, lately by pull factors, and during the shift by a mix of pull and push factors. Therefore, it could be argued that cross-sectional data could represent either one end (pull or push) or combinations (pull and push) according to the stage at which data is collected. This allows positioning the dynamism in entrepreneurial motive in the cross sectional studies, while highlighting the importance of investigating dynamism, if it is to understand the whole picture of entrepreneurial motivation. Adapting this theoretical argument to academic entrepreneurship, it is hypothesised in this research that academic entrepreneurial engagement in a resource constrained environment is motivated initially by push motives, but later by pull motives and during this shift, by a combination of pull and push motives.
3. Methodology

Sri Lanka is used as the study context to represent a resource constrained environment. According to the classification of the World Bank, Sri Lanka is a lower middle income country (The world bank 2011), and government expenditure on universities as a percentage of GDP in 2010 was only 0.27%, which represented 1.21% of total government expenditure (University Grant Commission Sri Lanka 2011). A recent study conducted in Sri Lanka has revealed that there is a lack of supportive mechanisms and institutional framework for university industry interactions. The same study has found that the research and development spending of Sri Lankan industry is very low (Esham 2008). These facts clearly justify the suitability of Sri Lanka to represent resource constrained environments. The use of a single case study is recommended in the literature to represent a particular context (Yin 2003), and/or to begin the process of theory development in an area that has received inadequate focus in prior research (Ryan et al. 2002).

Mixed methods were used in this research in a sequential manner, which is defined in the literature as ‘sequential triangulation’ (Morse 2003). Initially, an on-line survey was conducted, which is subsequently followed by an in-depth face to face interview phase. The use of mixed methods improved the validity of the research though triangulation (Tashakkori and Teddlie 1998). This had another advantage since it allowed comparing and contrasting static motives identified from cross sectional data gathered via the on-line survey and the dynamism of motivations identified from longitudinal data gathered via in-depth interviews.

The academics in 131 universities in Sri Lanka (total of 4215 as at 01.01.2009) (University Grant Commission Sri Lanka 2011) were considered as the population of this study. A sample of academics was selected for the on-line survey using cluster sampling technique. The unavailability of a list of elements in the population, as well as inability to cover all the universities during the in-depth interview phase led to decide to use this sampling technique. The use of it was further supported by ability to consider universities as natural clusters (Scheaffer et al. 2011). However, the use of natural clusters is criticised by Fleiss and Zubin

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1. Sri Lanka had 15 public universities. There weren’t any private universities other than some private institutions mainly focused on teaching. Out of the 15 universities, the University of Jaffna was excluded due to the issues related to accessibility. The University of Visual & Performing Arts was considered as a part of the University of Kalaniya since the two bodies were separated recently.
(1969) since it doesn’t provide any statistical or mathematical evidence for the existence of homogeneity among clusters (i.e., one university might not be similar to the other one). Therefore, Arber (2001) has recommended selecting a representative sample of clusters to reduce sampling errors, and thus, the age (Franklin et al. 2001), location, and size of universities (Friedman and Silberman 2003, Agrawal and Henderson 2002) were used as criteria for selecting universities. Accordingly, academics in 6 out of 13 universities were selected as the sample (N=1182). Nevertheless, the multilevel analysis of data using MLwiN software revealed that the variation in terms of entrepreneurial engagements by academics was not explained by variations at the university level (\( v_{0k} = 0.000(0.000) \)), which justified the use of universities as natural clusters in this context.

The on-line survey was used to investigate academic engagement in 17 academic entrepreneurial activities, during last 5 years, and the purpose of the timeline was to obtain comparable data (please refer appendix 1 for 17 academic entrepreneurial activities). Those who have engaged in at least one activity were asked to state to what extent they were motivated by each of the 15 motives illustrated in the Table 1, in a rating scale of 1 to 4 (1= extremely low, 2=low, 3=high, 4= extremely high, N/A= not applicable). The decision to use a four point rating scale could be justified by the findings of Bendig (1954), which revealed that there was no significant difference among 3 to 9 rating scales with respect to their reliability. Furthermore, the four point rating scale allows avoiding a middle point, the use of which has been criticised since respondents have a generally higher tendency to select the middle point (particularly in Asian cultures) (Lee et al. 2002, Cao et al. 2007).

The rate of response of the online survey was 30% (358 responses in total), and non-response bias test (Armstrong and Overton 1977) revealed that respondents do not differ significantly from non respondents with respect their universities \( X^2(5, 1182) = 2.976 \ p=.704 > 0.05 \), gender \( X^2(1, 1182)= 3.674 \ p=.06>.05 \), academic discipline \( X^2(7, 1182)= 10.410 \ p=.167>.05 \), and position \( X^2(2, 1182)= 1.015 \ p=.602>.05 \).

The on-line survey was followed by face to face in-depth interviews. From the respondents of the on-line survey, a sample of 78 academic entrepreneurs, which is a representative of the types of academic entrepreneurial activities carried out, was selected for in-depth interviews. Using the findings of an initial phase to derive a sample for a subsequent phase is a technique successfully adopted in a number of studies in social and behavioural sciences, which is
found to generate data with both breadth and depth (Teddlie and Yu 2007). A semi structured questionnaire was used during in-depth interviews to aid investigating whether there is a process with respect to engaging in different academic entrepreneurial activities, and if so, how motivations have been changed along the process.

Cross sectional data obtained from the online survey was analysed to check whether academics are motivated by one type of motives (i.e., pull or push) or a mix of pull and push motives. Data gathered through in-depth interviews was analysed qualitatively (using NVivo) to obtain an in-depth understanding about dynamisms in entrepreneurial motives, which was later used for data triangulation to improve internal validity (Outhwaite 1998, Modell 2009).

4. Findings

It was revealed during in-depth interviews that academic entrepreneurial engagement is a process, which starts by engaging in teaching related academic entrepreneurial activities, and then diversifies into research related academic entrepreneurial activities and company creation (the categorization of 17 academic entrepreneurial activities into three groups is illustrated in the appendix 1). The term ‘diversifying’ is used in this paper deliberately to illustrate that the engagement in company creation does not stopped academics carrying out teaching and research related academic entrepreneurial activities. As a result, academics had engaged in a combination of entrepreneurial activities. This is largely in line with Tijssen (2006) who defined academic entrepreneurial engagement as a process, in which engaging in more entrepreneurial activities was not found to prevent academics engaging in less entrepreneurial activities.

Accordingly, using the data gathered via the online survey, the respondents were categorised into three groups namely, single role academic entrepreneurs (those who have engaged in only teaching related academic entrepreneurial activities, N=30), double role academic entrepreneurs (those who have engaged in both teaching related and research related academic entrepreneurial activities, N=150), and triple role academic entrepreneurs (those who have engaged company creation besides engaging in teaching related, and research related academic entrepreneurial activities, N=122). The identification of the heterogeneity among academic entrepreneurs was important since data analysis with respect the dynamism in entrepreneurial motivation was structured around the three critical points of the entrepreneurial process; namely, 1. deciding to engage in teaching related academic
entrepreneurial activities, 2. deciding to diversify into research related academic entrepreneurial activities, and 3. deciding to diversify into company creation. The following sections initially analyse the cross-sectional data related to the motivation of academic entrepreneurs, and subsequently, discuss the dynamism in entrepreneurial motivation.

4.1. Academic Entrepreneurial Motive- Cross Sectional Data

Whether academics are motivated by one type of motives (pull or push) or a mix of pull and push motives was investigated by calculating median values separately for pull (the median of 10 pull motives) and push (the median of 5 push motives) motives for each academic entrepreneur. The median values were used since normality test revealed that data was not distributed normally. If the median of a particular type of motives (pull or push) was 1 (extremely low) or 2 (low) the effect of that motive for an academic was considered as low. If the median of a particular type of motives was 3 (high) or 4 (extremely high) the effect of that motive for the respective academic was considered as high. As illustrated in Table 2, four possible combinations were derived by considering the median of ‘pull’ and ‘push’ motives for each academic entrepreneur. Analysis revealed that the majority of academic entrepreneurs, from all the three types, were motivated either by a mix of pull and push factors, or by push factors.

Table 2: Pull and Push Motives

<table>
<thead>
<tr>
<th>Category</th>
<th>Basis for categorization</th>
<th>Triple role</th>
<th>Double role</th>
<th>Single role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly motivated by pull and push</td>
<td>Pull&gt;2, push&gt;2</td>
<td>47% (48)</td>
<td>52.9% (63)</td>
<td>50% (10)</td>
</tr>
<tr>
<td>Highly motivated by pull</td>
<td>Pull&gt;2, push &lt;=2</td>
<td>1% (3)</td>
<td>5.9% (7)</td>
<td>0</td>
</tr>
<tr>
<td>Highly motivated by push</td>
<td>Pull&lt;=2, push &gt;2</td>
<td>48% (49)</td>
<td>37.8% (45)</td>
<td>35% (7)</td>
</tr>
<tr>
<td>Low level of motivation by either pull or push</td>
<td>Pull&lt;=2, pull &lt;=2</td>
<td>3.9% (4)</td>
<td>3.4% (4)</td>
<td>15% (3)</td>
</tr>
</tbody>
</table>

As argued in the theoretical context, the existence of the two categories identified above (i.e., highly motivated by push factors, and motivated by a mix of push and pull factors) may be due to the stage of entrepreneurial process at which cross-sectional data is collected, which might be explained by dynamisms in entrepreneurial motive.
4.2. Dynamism in Entrepreneurial Motive

It was decided to analyse qualitative data on the dynamism in entrepreneurial motive for each type of the academic entrepreneur separately since the three types could be different with respect to their motivations.

4.2.1. Dynamism in entrepreneurial motive- Single role academic entrepreneurs

Single role academic entrepreneurs have engaged in at least one out of four teaching related academic entrepreneurial activities; namely, external teaching, initiating the development of new degree programmes, placing students as trainees in industry, and conducting seminars and training sessions for industry. It was revealed that their engagement is initially motivated by push motives such as insufficient income, inadequate contacts with industry, a lack of knowledge and skills among students on applied aspects, and a low level of demand for their degree programmes etc. However, over time, certain pull factors such as need for recognition/status, to improve employment opportunities to students, and to make use of their expertise etc had been added to the combination of motives.

One single role academic entrepreneur stated:

'I started engaging in external teaching since my salary was insufficient....... During my sabbatical leave period, I got experience abroad, and then, decided to introduce a new course in the external degree programme. .......There was a gap in the education market in Sri Lanka with respect to the X subject area (i.e., academic discipline in which he received experience abroad), even though it was highly demanded by industry '

It seems that his engagement was initially motivated by insufficient personal income, which is a push factor. Subsequently, certain other pull factors such as need to capitalise on his expertise, and the recognition of opportunity had been added, and as a result, now he is motivated by a combination of pull and push motives. It was also evident that none of the single role academic entrepreneurs was motivated only by pull factors. Therefore, it could be stated that single role academic entrepreneurs were initially motivated by push factors, and subsequently, by a combination of pull and push factors, which explain in the two prominent categories identified from the cross sectional data (Table 2).
4.2.2. Dynamism in entrepreneurial motive- Double role academic entrepreneurs

Besides carrying out teaching related academic entrepreneurial activities, double role academic entrepreneurs have engaged in at least one activity categorised under research related academic entrepreneurial activities; namely, working in the industry (research based), carrying out research based consultancy for industry through their universities or privately (but without forming a company), developing products or services with potentials for commercialization, acquiring research funding from government, non-governmental or international bodies, collaborating with industry through joint research projects, and providing research related assistance to small business owners. According to the double role academic entrepreneurs, their engagement in each type of activity (i.e. teaching related academic entrepreneurial activities, and research related academic entrepreneurial activities) was motivated initially by push factors, lately by pull factors, and during the shift by a combination of push and pull factors. For example, one double role academic entrepreneur explained how his motivation to engage in teaching related academic entrepreneurial activities has been changed over time:

‘I decided to conduct training and seminars to industry since I didn’t have contacts, which made it difficult for me to secure contracts from industry. Therefore, I made a great effort to secure opportunities to conduct training and seminars to industry. However, now I conduct these only if I’m invited by industry. The reasons for engagement now is to maintain contacts and for personal satisfaction’.

Even though conducting training and seminars in industry (i.e., a teaching related academic entrepreneurial activity) was initially motivated by push factors, now it is driven by pull factors. Nevertheless, his engagement in certain research related academic entrepreneurial activities has been still motivated by push factors. He said:

‘Since university lacks resources, I try to engage in joint research projects, so that I could make use of industrial resources. When preparing budgets for consultancy or other research projects, I try my level best to find ways to improve the resource status of the university’.

Another double role academic entrepreneur stated;

‘I decided to do consultancy since my income was not sufficient. My decision to apply for international funding was driven by a lack of funding received from my university to conduct
research. I couldn’t at least recruit a research student. Further, I wanted to develop my publication profile. I was successful in both consultancy and funding grants. After my initial successes, later funding applications were driven by my need to provide opportunities to students, to improve resource status of university, and to provide a service to the country/tax payers, in return for receiving free education. ............Two years back, I was promoted as a professor, So now I’m not pressurised to have publications, but I need to have funding to maintain my academic calibre. ............The motive for applying for consultancy also changed from insufficient income to need to improve my personal income in order to have more savings for my children’.

It seems that his engagement in research related academic entrepreneurial activities was initially motivated by insufficient personal and research income, which is a push factor. With the success achieved by these activities, some pull factors such as need to provide a service to students and to the country and to improve resource status of his university are added. However, now he is mainly motivated by pull factors such as desire for wealth and for maintaining a high academic standard.

Even though lately he has been motivated by pull factors, it should be noted that only a few double role academic entrepreneurs are motivated only by pull factors. As argued in the second section of this paper (i.e. theoretical context), this could be mainly attributed to the resource constrained environment in which they operate. Therefore, it could be stated that, similar to single role academic entrepreneurs, the dynamism in the motivations of double role academic entrepreneurs also supports the existence of two prominent groups illustrated in the Table 2.

4.2.3. Dynamism in entrepreneurial motive- Triple role academic entrepreneurs

Besides engaging in teaching and research related academic entrepreneurial activities, triple role academic entrepreneurs have engaged in at least one activity categorised under company creation; namely, contributing to the formation of joint ventures in which university and industry are the joint partners, the formation of joint venture/(s) privately through collaborating with industry, contributing to the formation of one or more new spin-off companies, contributing to the establishment of university incubators and/or science parks, contributing to the formation of university centres designed to carry out commercialization activities, and the formation of privately owned company/(s). The findings revealed that triple
role academic entrepreneurs also follow a similar pattern with respect to changes in their motives. In-depth interviews revealed that triple role academic entrepreneurs initially decided to engage in teaching related academic entrepreneurial activities due to insufficient personal income and a lack of reputation in the industry. However, their engagement in teaching related academic entrepreneurial activities was later changed to pull motives such as personal satisfaction, social status, a need to make use of knowledge/expertise, and career progression.

For example, one triple role academic argued:

'My attempt to engage in external teaching was initially prompted by insufficient personal income. However, now I conduct external teaching as a service to students and for personal satisfaction since there is no expert in my discipline to conduct relevant classes. The current income I gain from external teaching is insignificant in comparison to my total income.'

This clearly illustrates a shift in motives with respect to engaging in teaching related academic entrepreneurial activities by triple role academic entrepreneurs. Similarly, engagement in research related academic entrepreneurial activities by triple role academic entrepreneurs was initially motivated by push factors, but subsequently by both pull and push factors, and finally, mainly by pull factors. One academic entrepreneur said:

'I initially decided to engage in consultancy since I didn’t have a sufficient income. My decision to engage in joint research projects with industry was driven by not having adequate resources in the university to conduct research. With the development of these activities, further engagement was driven by status I received, need to do something beyond publications, and my creativity........I would say, these changes occurred gradually........Now I have a joint research lab and a privately owned company. Now I am motivated to engage in consultancy and joint research projects in order to bring more businesses'

In this case, push factors such as insufficient personal income and a lack of resources in universities were gradually changed to pull factors such as status, creativity, and desire for commercial success and wealth. Another triple role academic entrepreneur asserted:

'Initially, most of the engagements (i.e., teaching and research related academic entrepreneurial activities) were due to insufficient income and a lack of resources in my university. After starting our company, motives (for engaging in teaching and research related academic entrepreneurial activities) changed drastically. We were able to improve resource status of the university and develop reputation and credibility in the industry. As a
result, we received a lot of opportunities to engage in teaching and research related academic entrepreneurial activities and had resources in the university to capitalise on such opportunities. .......Sometimes, for small scale entrepreneurs, we provide services free’

This is also a clear illustration of how motives for engaging in teaching and research related academic entrepreneurial activities have been changed as a result of diversifying into company creation. In this example, motives to engage in teaching and research related academic entrepreneurial activities have been changed from push factors such as insufficient personal income and university resources to pull factors such as a need to capitalise on opportunities and to make use of resources, and for personal satisfaction. In a similar vein, triple role academic entrepreneurs’ engagement in company creation was initially motivated by push factors and lately by a combination of pull and push factors. One triple role academic entrepreneur explained:

‘University bureaucracy made it very difficult to be competitive when engaging in consultancy. Further, university rule doesn’t support competitive bidding. Therefore, I with a group of my colleagues started a company to provide consultancy services. This arrangement had resulted in us receiving substantially higher personal income. I think that it is due to the effective and efficient service delivered by us’.

His motivation to create a company was mainly driven by a need to avoid university red tapes which could be considered as a push factor and the desire for wealth which is a pull factor.

It should also be noted that, while the decision of creating companies by most of the triple role academic entrepreneurs was initially motivated by push factors, this was immediately followed by pull factors. In their opinion, the presence of push factors such as insufficient personal income, a lack of resources within universities, and delays occurred and difficulties encountered as a result of engaging in academic entrepreneurial activities via universities, would not have resulted in them starting a company, had they not been motivated by strong pull factors. The recognition of opportunity, need to do something new, creativity, status, desire for wealth, personal satisfaction, and the sense of achievement are the pull factors which motivated them to start and operate companies.
5. Discussion and Conclusions

The main aim of this paper was to investigate the dynamism in the motivations of academic entrepreneurs operating in resource constrained environments. Even though the hypothesis of this research assumed that the shift of motives from push to pull occurs along the entrepreneurial career of an academic, the findings revealed that it happens with respect to each type of academic entrepreneurial activity (i.e., teaching related academic entrepreneurial activities, research related academic entrepreneurial activities, and company creation), the engagement of which was motivated initially by push factors, subsequently by pull factors, and during the shift by a combination of pull and push factors. However, since academics initially engage in teaching related academic entrepreneurial activities, and subsequently diversify into research related academic entrepreneurial activities and company creation, a similar pattern of dynamism is observed along the entrepreneurial careers of them at the secondary level.

Insufficient personal income was a strong push motive that was common with respect to all the three types of academic entrepreneurial activities. Additionally, carrying out teaching related academic entrepreneurial activities was encouraged by certain teaching related push motives such as a lack of knowledge and skills among students on applied aspects, and a low level of demand for their degree programmes, as well as certain career led push motives such as inadequate contacts with, and a lack of reputation in, the industry. Similarly, inadequate research income, and a lack of resources in universities were the additional push factors that promoted diversifying into research related academic entrepreneurial activities. Likewise, the formation of companies by academics was pushed by some of the commercialization barriers such as university red-tapes, not having an industrial partner to commercialise their innovations, and university resource scarcities. However, gradually the engagement in each of these activities was motivated by pull factors such as a need for recognition/status, for personal satisfaction, for wealth, to make use of their expertise/knowledge, to achieve career success, to capitalise on opportunities, and to improve employment opportunities to students. It should also be noted that while pull factors related to engaging in teaching and research related academic entrepreneurial activities were added gradually, that related to company creation immediately followed push factors. In their opinion, the presence of push factors would not have resulted in them starting a company, had they not been motivated by strong pull factors.
These findings, to some extent, are in line with studies which had found that entrepreneurial motives vary according to the types of academic entrepreneurial activities (D'Este and Perkmann 2011, Jones-Evans 1997, D'Este and Patel 2007; Wigren-Kristoferson et al 2011). However, these studies have not investigated the dynamism in academic entrepreneurial motivations, which is one of the original contributions of this paper to the academic entrepreneurship literature. On the other hand, the findings of this study confirm the dynamism in entrepreneurial motive discussed in the general entrepreneurship literature (Schjoedt and Shaver 2007, Rosa et al. 2006, De Silva and Kodithuwakku 2011).

Academics’ being initially motivated by push factors was associated with resource scarcities such as insufficient personal and research income, and inadequate university resources etc. Similarly, resource scarcities have resulted in only very few of them being solely motivated by pull factors. These context specific findings are on par with the entrepreneurship literature, which has found a higher number of push entrepreneurs in developing countries (Wright et al. 2004, Bosma and Harding 2006, Acs 2006).

Moreover, this paper adds value to both the entrepreneurship and academic entrepreneurship literature by illustrating the ability to resolve the dichotomy between two perspectives, which debate on whether entrepreneurs are motivated by one type of motive (i.e., pull motives or push motives), or a mix of motives (i.e., pull and push motives). Since the engagement in each type of activity is initially motivated by push factors, and subsequently by a combination of pull and push factors, and finally by pull factors, motives identified from cross sectional data could vary depending on the stage at which data is collected. Hence, this paper highlights the importance of studying dynamisms in entrepreneurial motive to understand the whole picture of the motivations of entrepreneurs. Figure 1 summarises the findings in the form of a conceptual framework by illustrating the dynamism in motivations with respect to each academic entrepreneurial activity, which finally decides what motivates each type of academic entrepreneurs.
In addition to the theoretical contributions, paper also provides some practical implications for academics, universities, and policy makers. It seems that resource constrained environments have not suppressed academic entrepreneurship, but pushed academics to be entrepreneurial. Therefore, this research highlights the possibility of academics in such environments (e.g. developing low income countries) to make use of entrepreneurial engagements to pursue their academic and personal goals. It is also important that university managers and policy makers understand the dynamic nature of entrepreneurial motivation and its variation according to the type of entrepreneurial engagement. Therefore, there won’t be a one recipe to encourage all the types of academic entrepreneurial engagements at any point in time. Furthermore, it is found that academic entrepreneurial engagement is motivated by a myriad of monetary as well as nonmonetary motives, which might provide some insights for designing rewarding schemes for academics, particularly for those operating in resource constrained environments. Moreover, as revealed in this paper, academics use teaching and research related academic entrepreneurial engagements to pursue academic goals such as earning research income, and improving university resources. This emphasizes the importance of recognizing the value of these activities, which are currently undermined when compared with company creation. This also points out a window of opportunity for university managers to improve university resource status by encouraging engagements in teaching and research related academic entrepreneurial activities.

Since this research is carried out in one resource constrained environment, the general entrepreneurship literature was used to differentiate it from relatively resource-rich environment, which allowed theoretical generalization. Furthermore, due to similarities...
between Sri Lanka and other low income countries with respect to financial, institutional, infrastructural, human, and technological resource scarcities, the findings might also be generalised to these countries. Nevertheless, a single case study has its own limitations, and thus, it will be interesting to replicate this research in other similar and different settings in future research, which will allow theory development. This study investigated only the motivations to diversify academic entrepreneurial activities along the entrepreneurial careers of academics, but it didn’t study why some academics decide to discontinue diversification at one point (e.g. single role and double role academic entrepreneurs). This might be due to other micro, meso, and macro level factors that determine their behaviour, which will be of future research interest.

References


Appendix 1: The Types of Academic Entrepreneurial Activities

<table>
<thead>
<tr>
<th>Teaching related academic entrepreneurial activities</th>
<th>Research related academic entrepreneurial activities</th>
<th>Company creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) External teaching</td>
<td>(1) Working in the industry (research based)</td>
<td>(1) Contributing to the formation of joint ventures in which university and industry are the joint partners</td>
</tr>
<tr>
<td>(2) Initiating the development of new degree programmes</td>
<td>(2) Research based consultancy for industry through the university</td>
<td>(2) The formation of joint venture/(s) privately through collaborating with industry</td>
</tr>
<tr>
<td>(3) Placing students as trainees in industry</td>
<td>(3) Research based consultancy privately (but without forming a company)</td>
<td>(3) Contributing to the formation of one or more new spin-off companies</td>
</tr>
<tr>
<td>(4) Conducting seminars and training sessions for industry</td>
<td>(4) Developing products or services with potential for commercialization.</td>
<td>(4) Contributing to the establishment of university incubators and/or science parks</td>
</tr>
<tr>
<td></td>
<td>(5) Acquiring research funding from government, non-governmental or international bodies (those without collaborations with industry)</td>
<td>(5) Contributing to the formation of university centres designed to carry out commercialization activities</td>
</tr>
<tr>
<td></td>
<td>(6) Collaborating with industry through joint research projects</td>
<td>(6) The formation of your own company/(s)</td>
</tr>
<tr>
<td></td>
<td>(7) Research related assistance to small business owners.</td>
<td></td>
</tr>
</tbody>
</table>

(Source: De Salva et al 2011)