The Constraints of Innovation in Developing Countries:
Too many barriers to start-ups?
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Abstract

Start-ups are counted as ‘engine’ for innovation, especially in developing countries. However, in developing countries, bureaucratic barriers and costs are main impediments for start-ups. In this paper, the main barriers and costs are examined within panel data analysis framework in the developing countries indicating whether there are barriers and costs for start-ups between 2004 and 2012. Panel data analysis which has corrected robust standard errors for heteroscedascity and autocorrelation is used in this paper for researching start-ups condition in 61 developing countries. The results were obtained show that there are bureaucratic barriers and costs are main impediments for start-ups and innovation in the developing countries.

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1. Introduction

After the 1990s, when the world has been experienced the rapid technological developments. And thus, innovations have been playing crucial role for the economies. Especially R&D expenditures, inventions, patents, licenses and trademarks has been becoming important for economies than before. While the *copycatting* is counted essential for the developing economies for converge their technological level to developed countries, innovation plays important role for inventing new technologies and exporting them to the world.

In this paper, start-up procedures, which are essential for developing countries due to it shows bureaucratic level for newly establishing R&D firms in the developing countries, and start-up costs, which show easiness of entry to the market, relation with newly established firm numbers are investigated using panel data analysis between 2004 and 2012. This paper tries to shed some light in bureaucratic barriers and easiness of innovation in developing countries.

In this paper, the sections as following; second part of the paper in which main literature review and hypotheses are described and explained, in third part of the paper, the hypotheses are examined, empirically. In the last part of the paper, the general summary and main conclusion are described and depicted.

2. Literature Review And Hypotheses

Start-ups are often viewed as the source of “creative destruction” because they introduce new products that disrupt or overturn the positions of incumbent firms (Schumpeter, 1912/1934).

The stylized causality of economic development points to knowledge generates innovation and hence, innovation creating economic growth (Arrow, 1966). However, start-up rates could be differing significantly between countries and within regions of the same country. By contrast, there is a much smaller theoretical literature attempting the formal modelling of the start-up process within a region (Greis and Naude, 2009).

Start-up costs and lack of skills are two of the main challenges that entrepreneurs have to face when starting up new ventures (Papagiannidis and Li, 2005). The important role of ‘people’ in the foundation of any venture can not be under-estimated (Shane and Venkataraman, 2000). The rate of entrepreneurship can be measured statically as the self-employment rate or dynamically as the start-up rate of business firms. The start-up rate is increasingly being seen as equally, if not more, important than the growth of existing firms. Firms are more likely to grow in order to create new jobs and to promote new and flexible organisational forms (Naude, 2008; Greis and Naude, 2009).

In recent years, especially after the 1990s, a strong belief that “entrepreneurship” is a crucial driver of economic growth for both developed and developing nations has emerged among both scholars and policy makers.

The micro foundations of entrepreneurship, since the seminal contribution by Baumol (1990) we have known that “Schumpeterian innovative entrepreneurs” coexist with “defensive and necessity entrepreneurs.

Innovation is nowadays understood as the process of converting new ideas into marketable outcomes, and the role which innovation plays in driving economic growth has evolved significantly over the last two decades. The evolution in the understanding of innovation can best be discussed both in terms of the thinking regarding analytical issues and also in terms of advances in empirical matters (McCann and Argiles, 2013: 187-189). Local social and professional networks decrease the uncertainty and costs associated with start-up activity, which encourages the provision of venture capital. The flow of information that serves as a common stock of knowledge in the region for innovations also sets the foundations for the exploration and exploitation of new knowledge by startups (Winne and Sels, 2010: 1864). Start-ups aiming for an innovation strategy actually succeed in being innovative. Building on small business and entrepreneurship literature, we argue that human capital and human resource management are critical success factors for innovative output in start-ups. The processes which drive innovation, and the spatial manifestations and implications of innovation outcomes, have all become central themes in modern regional development analysis. The reason is that innovation has become accepted as a key driver of economic growth and the spatial aspects of innovation therefore impact on the growth fortunes of regions (Porter 1990). To our knowledge, the impact of venture capital on the persistence of innovation activities has not been analyzed so far (Arvanitis and Sticki, 2013).

Innovation activity is a costly task in that new firms often cannot finance themselves as they generate only limited cash flows and seed capital is often scarce.

Innovation is a concept which is recently mentioned not only the academicians but also the labour environment and the politician’s programme. Because of globalization of word trade lost of countries have been a rival each other at many market has start to exist many produce which are similar each other. In this case the rivalry has been low price
rivalry. Both developed countries and developing countries are presented as a proposal solution to make innovation for coping with these negativities and for increasing the gain. The size of R&D allocations plays a significant role in determining their innovation strategies.

3. Methodology

In this study, the startup procedures and startup costs effect on new business establishment relation is investigated in 61 developing countries. Startup costs and startup procedures are the main impediment of innovation.

3.1. Hypotheses

The hypotheses of the paper are as following;
H₁= the elasticity of start-up costs and new business establishment relation is negative,
H₂= the elasticity of the start-up procedures and new business establishment relation is negative

3.2. Methodology and Findings

Panel data analysis is employed for testing whether the startup procedures and costs effect on new business establishment are negatively related or not.

All data were taken from World Bank (2013) Data. And the time spans between 2004 and 2008 due to lack of data and avoid estimating unbalanced panel data analysis.

Table 1. Descriptive Statistics

|                      | Mean   | Std.Dev. | Minimum | Maximum |
|----------------------|--------|----------|---------|---------|
| New Business Registered | 22830.41 | 58722.13 | 9       | 483970  |
| Start-up procedures  | 37.96  | 3.30     | 3       | 28      |
| Start-up costs       | 9.31   | 28.94    | 3       | 152     |

In Table 1, the descriptive statistics are depicted. As we seen in Table 1, the mean of new registered business is 22830.41 between 2004 and 2008, while minimum of new registered business is 9, maximum of new registered business is 483970 in the developing countries. The mean of start-up procedures is 37.96 days. While the minimum time for start-up procedures is 3 days, the maximum time is 28 days. Logarithms of all the variables were taken before unit root process and panel OLS methods.

Before testing the hypotheses in panel data framework, we need to test whether the series has unit root by panel unit root tests. Levin, Lin and Chu (2002) (henceforth LLC) and ADF-Fisher based Maddala-Wu (1996) (henceforth MW) panel unit root tests are employed for testing the unit root of the series. All series are I (0) (stationary in the level) according the unit root test results.

Table 2. Diagnostic Tests

| Heteroscedasticity Tests                       | Woolridge Autocorrelation Test                  |
|-----------------------------------------------|------------------------------------------------|
| Modified Wald Test for Fixed Effects Panel OLS| 35010.87, p value = 0.00                         |
| Breusch-Pagan Lagrange Multiplier Test for     | 559.74, p value = 0.00                          |
|                                               | F(1, 60), p value = 0.28                        |

For saving space, the unit roots test results were not given here, however, it can be requested from the authors.
According to the results of diagnostic tests, there is no autocorrelation, while there are heteroscedasticity problems for fixed and random effects models. Therefore, Arellano (1987), Froot (1989) and Rodgers (1993) robust model was selected instead of standard panel fixed and random effect models. Due to heteroscedasticity problem, Arellano (1987), Froot(1989) and Rodgers(1993) Panel Regression Models were estimated, which are in fixed and random effect OLS models. The estimation results were depicted in Table 3.

Table 3. Arellano (1987), Froot(1989) and Rodgers(1993) Panel Models Results

| Dependent variable: Log (NBR) | Model I: fixed effect | Model II: Random effect |
|-------------------------------|-----------------------|-------------------------|
| C                             | 10.15, p value = 0.00 | 10.15, p value = 0.00   |
| Log (SP)t                     | -0.31, p value = 0.01 | -0.32, p value = 0.02   |
| Log (SC)t                     | -0.29, p value = 0.00 | -0.33, p value = 0.00   |
| R²                            | 0.17 (within)         | 0.16 (within)           |
| Ftest                         | 20.97, p value = 0.00 | -                       |
| Wald χ² Test                  | -                     | 50.97, p value = 0.00   |

Table 4. Pooled OLS Method

| Dependent variable: Log (NBR) | Model III: Standard Pooled Model |
|-------------------------------|---------------------------------|
| C                             | 8.51, p value = 0.00            |
| Log (SP)t                     | 1.11, p value = 0.00            |
| Log (SC)t                     | -0.77, p value = 0.00           |
| R²                            | 0.17                            |
| Ftest                         | 6.84, p value = 0.002           |

According to the estimation results the elasticity that estimated between startup cost and new business registered are %31 negatively, %33 negatively and %77 negatively for fixed, random and pooled model, respectively. For the elasticity of startup procedure and new business registered are %29,%33 negatively for fixed and random model, respectively.

According to Pooled OLS results, the elasticity between new business registered and start up procedures is %111, and it is significant at %5 statistical significance level. This shows the opposite result for the results of fixed and random effect models. All the estimated models are consistent according to F and Wald Test results. And the goodness of fit of the models are %17,%16 and %17 for fixed, random and pooled model, respectively.
4. General Discussion and Conclusion

In the paper, start-up procedures and costs are taken as main impediments /barriers of innovation in the economies. The startup procedures, costs and new business registered elasticity were researched in this paper in 61 developing countries between 2004 and 2008, by panel data framework. We found that there is a negative, albeit not too high, elasticity between start-up procedures and new business registration, and for startup costs and new business registration in the countries in the fixed and random effect models. The pooled model shows the elasticity of start-up procedures is positive, however three models approve that there is negative elasticity between start-up costs and new established businesses.

The results show and prove that the costs and legal procedures are crucial for innovation and development relationship in the developing countries.

5. Recommendations for Further Researches and Limitation of the Study

The paper contributes to the literature in terms of emphasizing the bureaucratic sides of innovational policies in developing countries. The innovational policies for establishing of start-ups and encouragement to innovations in developing countries are examined in the paper. This paper in which empirically tested to innovational policies in developing countries is counted as one of the empirical papers in this field.

The time span of this paper is limited due to lack of data, we had had to use cross-country data in that period because of this problem. If country level specific data/observations find, country level papers/researches may discover/find/emphasize new problems/impediments for start-ups and innovations in the country level (country specific).

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