Startup Meter | Methodology

Abstract

This paper summarises the methodological foundations of Startup Meter's Startup Friendliness Index (SFI), a comprehensive analysis of startup ecosystems at the city-level through an indicator-based approach. Seven cities, Accra, Amman, Beirut, Cairo, Nairobi, Rabat, and Tunis, are the cities that make up the first edition of the SFI. The focus on the emerging and developing cities fills an important gap in the research on the entrepreneurship ecosystem, which has been traditionally focusing on country-level analyses in the developed markets.

The key metrics of a startup ecosystem are summarised under the six domains that make up the SFI, namely Human Capital, Finance, Startup Scene, Infrastructure, Macro, and Market. The index data is collected through surveys conducted among relevant stakeholders, through research, and from existing reports and databases of relevant organisations (e.g.: World Bank Group, United Nations, etc.). The goal is to empower actors to generate positive change by having access to comprehensive information about their respective startup ecosystem.

Introduction

The Startup Meter assesses the business-friendliness of startup ecosystems on the city-level through a comprehensive indicator-based analysis. Considering the acknowledged importance of entrepreneurial activity for the socio-economic development of a country, city or region, Startup Meter's main contribution is a better understanding of the entrepreneurial environment on the local level, given the potential and often prevalent regional differences within a country. Furthermore, endeavours to map entrepreneurship ecosystems have so far been either restricted to country-level analyses or developed cities. Consequently, the next logical step is to focus on local research in the emerging and developing world.

The Startup Meter is an endeavour to establish a framework and conceptualisation for assessing the startup potential of local ecosystems in developing countries and emerging economies with the goal to make policies, incentives and development aid, in their focus and support on entrepreneurship, more effective and precisely targeted, and thus helping in the creation of jobs and the establishment of a more sustainable economy.

The indicators in the Startup Meter assess crucial domains of the entrepreneurship ecosystem (ranging from funding opportunities to the legal framework, and support structures for entrepreneurs) and show where further support or reforms are needed to strengthen the business environment and make the creation of startups less burdensome.

Startup Ecosystem Approach

An ecosystem approach, be it a natural or a business ecosystem, takes into consideration the interaction and complex relationship of various key players and components in a specific environment. The term ecosystem, in relation to the business environment, was originally coined by James F. Moore, stating that "innovative businesses can't evolve in a vacuum (1993, p. 75). They must attract resources of all sorts, drawing in capital, partners, suppliers, and customers to create cooperative networks" (Moore, 1993, p. 76). Ever since, the notion of an entrepreneurial ecosystem has been the focus of a number of (academic) studies (Gnyawali & Fogel, 1994; Isenberg, 2011; Kantis & Federico, 2012; Kshetri, 2014; Mason & Brown, 2014). One definition that seems to cover these views is the understanding of the entrepreneurial ecosystem as a "set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship" (Stam, 2014, p. 1).

A well-functioning entrepreneurial ecosystem can have a significant role in fostering economic and social development on the local, regional and national level. Through the complex interaction of key players such as governmental agencies, (financial) institutions and associations, investors, with additional components such as the availability of qualified labour force and a supportive culture, an entrepreneurial ecosystem has the capacity to develop and enhance the entrepreneurial climate, and enable the development of new ideas and innovation to reach the market. As such, a healthy entrepreneurial ecosystem "can attract latent high-tech entrepreneurs and other types of high-expectation entrepreneurs because people see a chance to build successful companies" (Kshetri, 2014, p. 42). As Kshetri points out, the entrepreneurship ecosystem approach 'provides a practical and holistic' method in the understanding of the development of an entrepreneurial environment (Kshetri, 2014, p. 42). A healthy entrepreneurial ecosystem supports and encourages entrepreneurs to follow their entrepreneurial endeavour. An environment where entrepreneurship is valued and encouraged, where sufficient support, skill and knowledge gains are available, makes it more likely that new businesses emerge and grow (Gnyawali & Fogel, 1994, p. 45). One single element may not have a significant effect, but the interaction of various components is understood to enhance business opportunities. While some criticise the entrepreneurship ecosystem approach for a lack of causal depth and a clear demarcation (Stam, 2014, p. 3), it nonetheless offers a multidimensional perspective on a local or regional business environment. The focus lies in the conditions required to generate business ventures and on the "interactions between framework conditions and local/regional geographical environments"(Mason & Brown, 2014, p. 8).

Indicator-based Analysis

Indicators simplify complex connections and allow for a comparison between elements that are difficult to measure. An indicator is a qualitative or quantitative measure resulting from the observation of facts that give an insight into the positions (for instance of a country) in a given area and draw attention to specific issues (OECD & European Commission Joint Research Center, 2008, p. 13). In order to map and measure complex systems, an indicator-based analysis provides the right tools. Composite indicators have been consistently used as a bridge between academia and policy-

making to ease the transfer of knowledge, identify key issues, and potentially observe progress over time. These aspects served as the decisive factors behind choosing a composite indicator model for the analysis of city-level startup ecosystems.

The vast majority of research on the entrepreneurship ecosystems is focused on European and American countries or cities - developing and emerging economies are largely left out. Startup Meter is looking to fill this gap and foster entrepreneurship development and good practices by focusing on emerging and developing markets. Seven cities in the Middle East and Africa have been chosen as the starting point for the Startup Meter: Accra, Amman, Beirut, Cairo, Nairobi, Rabat, and Tunis. This number allows a constructive first analysis and the possibility of comparison between these cities through a ranking of all the indicators.

Structure

The Startup Friendliness Index (SFI) is a composite indicator with a four-level structure meant to render the overall process of data aggregation more meaningful. The structure (from top to bottom) is the following:
- index (SFI)
- domains
- sub-domains
- indicators.

Through this approach, the complexity of a startup ecosystem is mapped through 6 domains, each containing two or three sub-domains. In turn, every sub-domain consists of clusters of indicators. The following section provides an overview of the domains in our index.

Human Capital captures the availability of qualified workforce. Finance looks at the availability of funding from a variety of sources (eg: banks, VCs, public funding) and at the experience startups have had so far with accessing those sources. Startup Scene provides an overview of support organisations like accelerators and networking events. Infrastructure captures relevant information related to transportation, access to utilities, and ICT. Macro looks at matters of, taxation, business registration, legal matters and wider questions of political stability. Market shows business opportunities, e.g. Global Connectedness which we believe are important to add an international dimension to our analysis in terms of, international accessibility and governmental openness.

Index Methodology

Following the best practices in composite indicator building, the Startup Friendliness Index is calculated in several steps:

1. selection of indicators and design of index structure;
2. normalisation;
3. aggregation.

1. Selection of indicators and design of index structure

The basis of the selection process consists of a qualitative assessment of the pool of indicators on startups and entrepreneurship conditions. The suitability of potential indicators is assessed according to five quality dimensions: *relevance*, *availability of data*, *reliability of sources*, *accuracy*, *timeliness*. Following the selection of indicators, those chosen are clustered thematically into sub-domains and domains, in accordance with the main concepts identified in the literature on startup and entrepreneurship ecosystems. A combination of different methods has been used in order to gather the index data, namely surveys conducted among relevant stakeholders, Startup Meter's own research, and reports and databases of relevant organisations (e.g.: World Bank Group, United Nations, etc.).

2. Normalisation

The normalisation method chosen for the SFI is the min-max normalisation. Using this method, the normalised values of all indicators have an identical range, [0, 1]. More specifically, the normalisation is carried out using the following formulas:

- for indicators where a high value is desirable:

$$I_{s,i,j} = \frac{x_{s,i,j} - min(x_{s,i})}{max(x_{s,i}) - min(x_{s,i})};$$

- for indicators where a low value is desirable:

$$I_{s,i,j} = \frac{max(x_{s,i}) - x_{s,i,j}}{max(x_{s,i}) - min(x_{s,i})},$$

Legend:

$I_{s,i,j}$ = normalised value j of indicator i from sub-domain s

$x_{s,i,j}$ = initial value j of indicator i from sub-domain s
$max(x_{s,i})$ = the maximum value of indicator i from sub-domain s
$min(x_{s,i})$ = the minimum value of indicator i from sub-domain s

3. Aggregation

An index that aims to describe startup ecosystems has to account for the real-life interactions between components of the ecosystem. A very good statistical performance in one domain may not materialise in practice if other domains of the ecosystem have a comparatively much poorer performance. Startup Meter experimented with different methods of aggregation, including averages, weighted averages, and geometric mean. In order to account for the aforementioned interactions between domains, a combination of the geometric mean and simple mean is the chosen aggregation method. The use of the geometric mean is documented in the state-of-the-art in composite indicator building published by the OECD in 2009. The simple mean is used for the indicators to sub-domain aggregation, as well as for the sub-domains to domain aggregation. Finally, the geometric mean gives the final index value, as the aggregation of the 6 domains.

Index aggregation:

$$SFI = \sqrt[6]{D_1 * D_2 * \ldots * D_6}$$

Sub-domains to domain aggregation:

$$Domain_d = \frac{\Sigma_i^n S_{d,i}}{n_d},$$

$S_{d,i}$= Sub-domain i of domain d;
n_d = total number of sub-domains in domain d.

Indicator to sub-domain aggregation:

$$Sub-domain_s = \frac{\Sigma_i^n I_{s,i}}{n_s},$$

$I_{s,i}$= normalised value of indicator i of sub-domain s;
n_s = total number of indicators in dub-domain s.

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