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Incubators as Tools for Economic Growth and Technology Transfer in Developed Countries

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Abstract
The aim of this paper is to explore, investigate and identify the key challenges of incubators focussing on four groups: economy, policy, industry, and culture. The identification is based on several varibles for each group. The nature of this research is mainly qualitative. This investigation uses one semi-structured interview based in the United States and organizational documents. The research findings suggest that there are three key challenges of incubators: 1) high number of jobs creation, high number of graduate companies and high survival rate of tenants lead to economic development, 2) high cooperation of R&D and high innovation lead to technology commercialization, and 3) high sustainable growth, high entrepreneurial climate and high smart-growth networking lead to fostering entrepreneurship. The authors believe that this paper presents added value to the current literature on the key challenges of business incubation in the United States. Also the research will support academia and practitioners for successful implementations and follow up.
Keywords: Jobs creation, technology commercialization, entrepreneurship, incubators, economic growth.

1. Introduction
Practitioners whether government and policymaker academia, researchers and experts concentrate on the role of business incubation program as an active role in the employment to support economic growth (Allen and Levine, 1986; Mian, 1997; Thierstein and Wilhelm, 2001; Roper, 1999) and technology commercialization and transfer (Mian, 1994; Phillips, 2002; McAdam and McAdam, 2008).
European Business and Innovation Centre Network (EBN), 2012 indicated the results for 2011: the total number of jobs created was 12460 with an average of 9585 jobs and median of 2500. The enterprise survival rate within incubation was 91.42%; the percentage of the services for commercialization 17%; and innovation diagnostic, 22%.
The objective of this paper is to explore, investigate and identify the key challenges of incubators focussed on four groups; economy, policy, industry, and culture. The identification is based on several varibles for each group.
The structure of this paper is as follows: Section 2 provides a literature review of business incubation (BI). In Section 3, the research methodology includes the evidence from the literature review and one real interview of a business incubation program located in the United States. In Section 4, the authors briefly discuss the findings of the study drawn from qualitative approaches of incubators. Section 5 concludes with implications of incubators in developed countries.

2. Related Literature Review of Business Incubation
Many scholarly articles discussed the importance of incubators as a value added vital tool for developed and developing countries. Entrepreneurs use incubators services for networking among companies and accessing to the resources (Sweeney, 1987; Allen and McCluskey, 1990; McAdam, et al., 2006; Hansen, et al., 2000; Hughes, et al., 2007). In addition, incubators are goals for technology commercialization and transfer (Mian, 1996a, 1996b, 1997; Phillips, 2002; Rothaermel and Thursby, 2005a, 2005b; McAdam and McAdam, 2008; Akçomak and Taymaz, 2007). Moreover, incubators act as a tool for jobs creation (Thierstein and Wilhelm, 2001; Frenkel et al., 2008; Roper, 1999; Abetti, 2004). Finally, incubators are used to support a startup with several services (Smilor and Gill, 1986; Allen and Rahman, 1985; Allen and McCluskey, 1990; Lalkaka, 2002; Hannon, 2005; Mian, 1997; Adegbite, 2001).
Al-Mubaraki and Busler (2013a) focused on five practical case studies and their successful adaption in developing countries. Based on three key indicators for each case study: 1) founded year 2) number of client companies, and 3) number of graduate companies. The study findings state that entrepreneurship, incubators and innovation contribute to the international economy and play a vital role, not only in the economic recovery but also in smart growth and economic development. In developing countries, the adaptation leads to the support of entrepreneurial climate, fostering the innovation to commercialise the new technologies and jobs creation.
Al-Mubaraki and Busler (2013b) described in their study the incubators model in developing countries. The

positive impact of business incubators leads to economic development. They concluded that incubators are an effective tool for economic development. The study supported previous work that suggests that quality initiatives and careful planning of incubators may present a pathway to stimulate an economy and in particular in the developing countries.
Al-Mubaraki and Busler's (2012a) study results showed the best practice model based on the lessons learned from case studies: 1) clear objectives, 2) incubators location, 3) access to services, 4) employment creation, and 5) economic development strategy. Al-Mubaraki and Schrödl (2011) indicated the four dimensions discussed in the study in determining the effectiveness of business incubators individually and as an industry. Al-Mubaraki and Busler (2012b) showed through survey results of 100 incubators programs led to the adaptation of incubators programs in developing countries, as well as GCC states, and as a modern tool for fostering the innovation and entrepreneurial climate with technology transfer.

3. Research Methodology

The research methodology used in this research study is comprised of desk-research and interviews using several varibles for the program and providing depth understanding of the research landscape and a rich insight into the research objectives (Eisenhardt, 1989; Yin, 1999). Interviews were conducted with the top management personal of of the Small Business Administration (SBA) located in Washington , DC, US. See Chart 1.
The international interview design is based on two charts. First, the Key Challenge Chart consists of four groups: 1) Economy, 2) Policy, 3) Industry, and 4) Culture. Each group is measured on a scale of 1, 2, 3 and 4. The number reflects the challenge in each incubation program ,the scale of 1 represents low challenge; scale of 2, low to moderate challenge; scale of 3, moderate challenge; and scale of 4, high challenge. Second, the Radar Chart consists of three groups: 1) Economic development; 2) Entrepreneurship; and 3) Technology commercialization. In addition, each group is measured by varibles and each variable is a rank-order independent variable [e.g., low (L ,60%), moderate (M, 80%), and high (H, 100%)].

4. Findings and Discussion

From the current literature, it is evident (see Section 2 above) that of business incubation program has an active role in employment to support economic growth (Allen and Levine, 1986; Mian, 1997; Thierstein and Wilhelm, 2001; Roper, 1999) and technology commercialization and transfer (Mian 1994, 1997; Phillips, 2002; McAdam and McAdam, 2008).
First, Chart 1 shows the distribution of responses regarding the four groups. The results of key challenges with respect to economy and culture indicated the highest challenges of their incubators with high employment, high survival rate, high start-up companies and high rate of client companies inside the incubators with a scale of 4. Policy and industry described their programs as medium challenge of their program with medium incubator funding, medium role of industry, medium Incubators type, medium incubators services and medium Incubators size. Overall, the key challenges present a positive impact of incubators an economy, culture, policy and industry. See Chart 2.
Second, Chart 2 shows that the respondents answered high variables for all groups. Overall, the three groups presented high indicators which reflect the positive potential on the economic development, entrepreneurship and technology commercialization. (See Chart 3. See Table 1 for the summary of Radar Charts of SBA in Washington DC, US.)

5. Conclusion and Reflection

In the developed countries as well as in the United States supporting incubators as vital tools for economic growth, entrepreneurship, and technology commercialization and transfer are an asset that provides an array of services for the incubatee.
The results of the interview showed the three key challenges: 1) high number of jobs creation, high number of graduate companies and high survival rate of tenants lead to economic development, 2) high cooperation of R&D and high innovation lead to technology commercialization, and 3) high sustainable growth, high entrepreneurial climate and high smart growth networking lead to fostering the entrepreneurship.
This paper is based on one interview that investigated incubators program in the United States, developed countries that addressed and explained the key challenges and variables. In the future the authors plan to conduct interviews in Europe and the Middle East for incubators best practice.

References

Abetti, P.A. (2004), 'Government-Supported Incubators in the Helsinki Region, Finland: Infrastructure, Results, and Best Practices', Journal of Technology Transfer, 29 (1): 19–40.
Adegbite, O. (2001), 'Business Incubators and Small Enterprise Development: The Nigerian Experience', *Small*

Business Economics, 17 (3): 157–66.
Akçomak, I.S. and Taymaz, E. (2007), 'Assessing the Effectiveness of Incubators: The Case of Turkey'. In V.V. Ramani, and A.V. Bala Krishna (eds), *Business Incubation: An Introduction*. Hyderabad: Icfai University Press, 234–64.
Allen, D. and Levine, V. (1986), 'Nurturing Advanced Technology Enterprises: Emerging Issues in State and Local Economic Development Policy'. New York: Prager.
Allen, D. and McCluskey, R. (1990), 'Structure, Policy, Services and Performance in the Business Incubator Industry', *Entrepreneurship, Theory and Practice*, 15 (2): 61–77.
Allen, D. and Rahman, S. (1985), 'Small Business Incubators: A Positive Environment for Entrepreneurship', *Journal of Small Business Management*, 23 (July): 12–22.
Al-Mubaraki, H. and Busler, M. (2012a), Quantitative and Qualitative Approaches of Incubators as Value-added: Best Practice Model'. Accepted - will be published in The Journal of American Academy of Business, Cambridge, Vol. 18, September 2012. Available online: <http://www.jaabc.com/jaabcv18n1preview.html
Al-Mubaraki, H. and Busler, M. (2012b), 'Innovation, Entrepreneurship and Technology Commercialization In Developing Countries: A GCC Perspective in an International Context', *European Journal of Business and Management*, Vol 4, No 19 (2012), pp 141-158.
Al-Mubaraki, H. and Busler, M. (2013a), 'Incubators successes: Lessons learned from successful incubators towards 21st century'. WASD 2013 Annual Conference, The London School of Economics and Political Science (LSE), 2-4 September 2013, London, United Kingdom. Available online: http://worldsustainable.org/index.php/wasd-2013.
Al-Mubaraki, H. and Busler, M. (2013b), 'The Effect of Business Incubation in Developing Countries', *European Journal of Business and Innovation Research (EJBIR*), Vol. 1, No. 1, March 2013, pp.19-25.
Al-Mubaraki, H. and Schrödl, H. (2011), 'Measuring the Effectiveness of Business Incubators: A Four Dimensions Approach from a Gulf Cooperation Council Perspective', *Journal of Enterprising Culture,* Vol. 19(4), pp. 435–452.
Eisenhardt, K. (1989), 'Building theories from case study research', *Academy of Management Review,* Vol. 14 No. 4, pp. 532-50.
European Business and Innovation Centre Network (EBN). (2012), 'BIC Observatory Facts and Figures'. Available online: http://www.ebnsoftlanding.org/upload/file/BIC_Observatory_Report_2012.pdf
Frenkel, A., Shefer, D. and Miller, M. (2008), 'Public versus Private Technological Incubator Programmes: Privatizing the Technological Incubators in Israel', *European Planning Studies*, 16 (2): 189–210.
Hannon, P.D. (2005), 'Incubation Policy and Practice: Building Practitioner and Professional Capability', *Journal of Small Business and Enterprise Development*, 12 (1): 57–78.
Hansen, M.T., Chesbrough, H.W., Nohria, N. and Sull, D.N. (2000), 'Networked Incubators: Hothouses of the New Economy', *Harvard Business Review*, 78(5): 74-84.
Hughes, M., Ireland, R.D. and Morgan, R.E. (2007), 'Stimulating Dynamic Value: Social Capital and Business Incubation as Pathway to Competitive Success', *Long Range Planning*, 40: 154–77.
Lalkaka, R. (2002), 'Technology Business Incubators to help build an Innovation-Based Economy', *Journal of Change Management*, 3 (2):167-176.
McAdam, M. and McAdam, R. (2008), High Tech Start-ups in University Science Park. Incubators: The Relationship between the Start-Up's Lifecycle Progression and use of the Incubator's Resources, *Technovation*, 28 (5): p. 277–90.
McAdam, M., Galbraith, B., McAdam, R. and Humphreys, P. (2006), 'Business Processes and Networks in University Incubators: A Review and Research Agendas', *Technology Analysis and Strategic Management,* 18 (5): 451–72.
Mian, S.A. (1996a), 'Assessing the Value-Added Contributions of University Technology Business Incubators to Tenant Firms', *Research Policy*, 25: 325–35.
Mian, S.A. (1996b), 'The University Business Incubator: a Strategy For Developing New Research/Technology-Based Firms', *The Journal of High Technology Management Research*, 7: 191–208.
Mian, S.A. (1997), 'Assessing and Managing the University Technology Business Incubator: An Integrative Framework', *Journal of Business Venturing*, 12: 251–285.
Mian, S.A. (1994), 'Are University Technology Incubators Providing a Milieu for Technology-Based Entrepreneurship?' *Technology Management*, vol. 1, pp. 86–93.
Phillips, R.G. (2002), 'Technology Business Incubators: How Effective as Technology Transfer Mechanism?', *Technology in Society*, 24: 299–316.
Roper, S. (1999), 'Israel's Technology Incubators: Repeatable Success or Costly Failures', *Regional Studies*, 33 (2): 175–80.
Rothaermel, F.T. and Thursby, M. (2005a), 'Incubator Firm Failure or Graduation? The Role of University

Linkages', *Research Policy,* 34 (7): 1076–90.
Rothaermel, F.T. and Thursby, M. (2005b), 'University-Incubator Firm Knowledge Flows: Assessing their Impact on Incubator Firm Performance', *Research Policy*, 34 (3): 305–20.
Smilor, R.W. and Gill, M.D. (1986), 'The New Business Incubator: Linking Talent, Technology, Capital, and Know-How', Massachusetts: Lexington Books.
Sweeney, G.P. (1987), 'Innovation, Entrepreneurship and Regional Development', London: Francis Pinter.
Thierstein, A. and Wilhelm, B. (2001), 'Incubator, Technology and Innovation Centres in Switzerland: Features and Policy Implications', *Entrepreneurship and Regional Development*, 13 (4): p. 315–31.
Yin, R.K. (1994). 'Case Study Research – Design and Methods', 2nd ed., *Sage Publications*, Newbury Park, CA.

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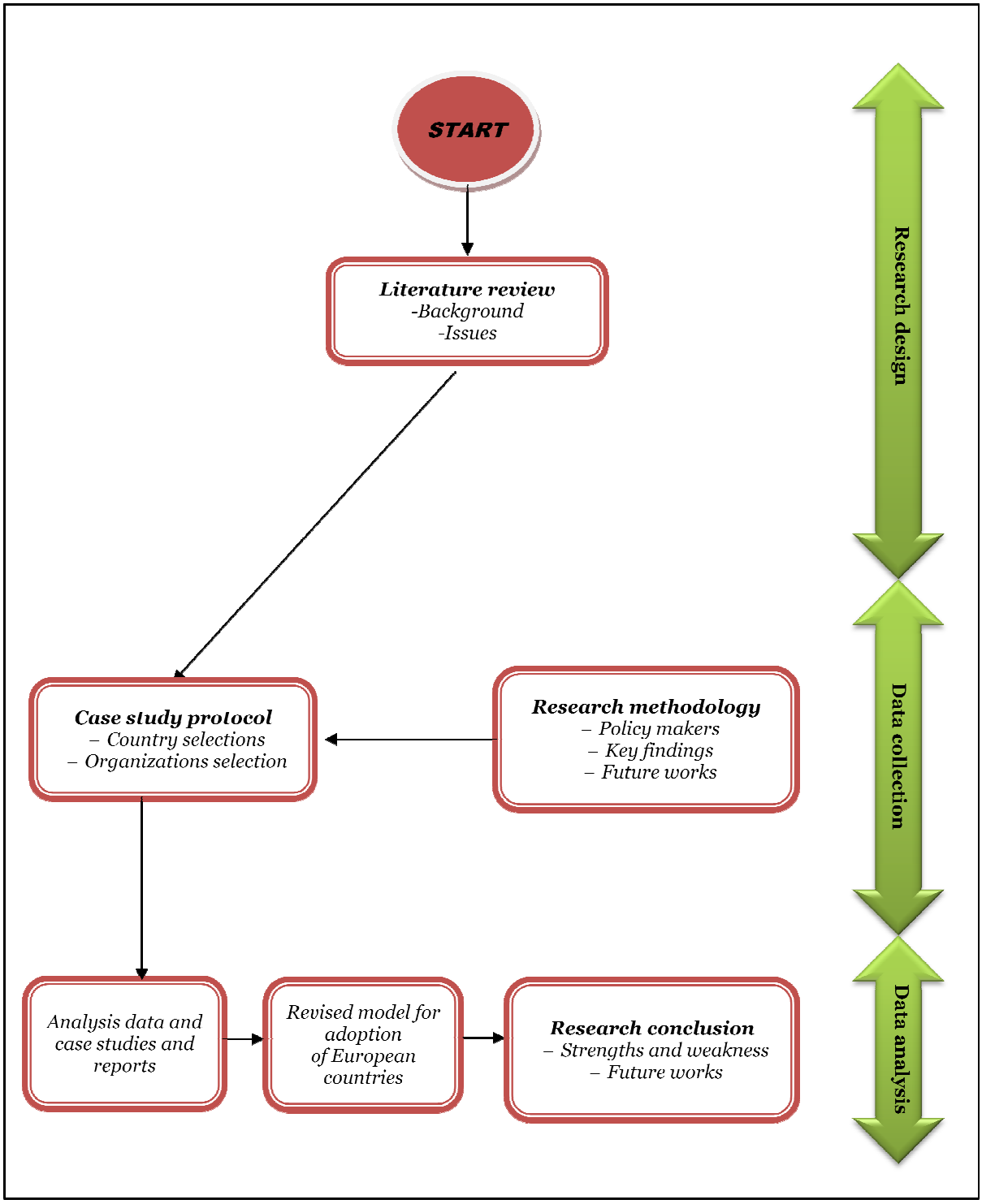

Chart 1: Research Methodology Chart

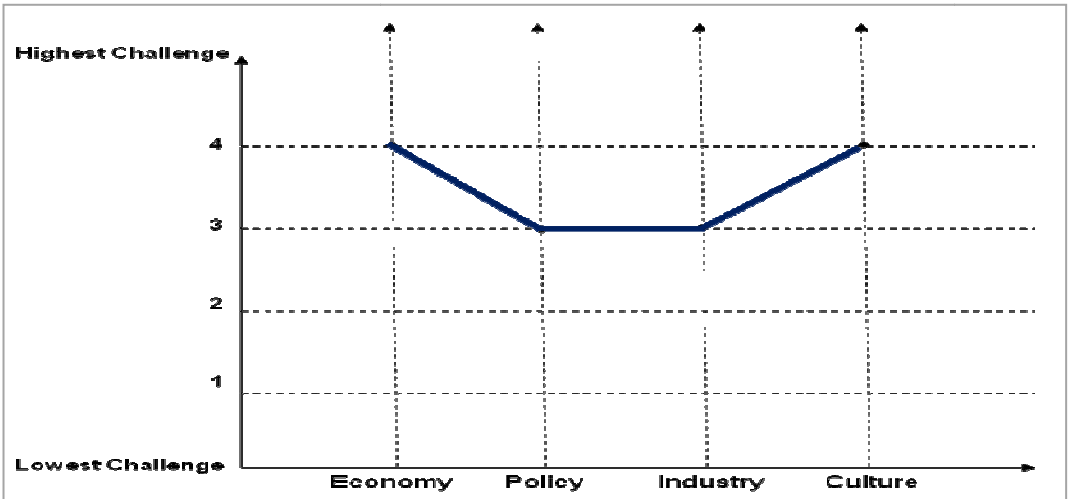

Chart 2: Key Challenge Chart

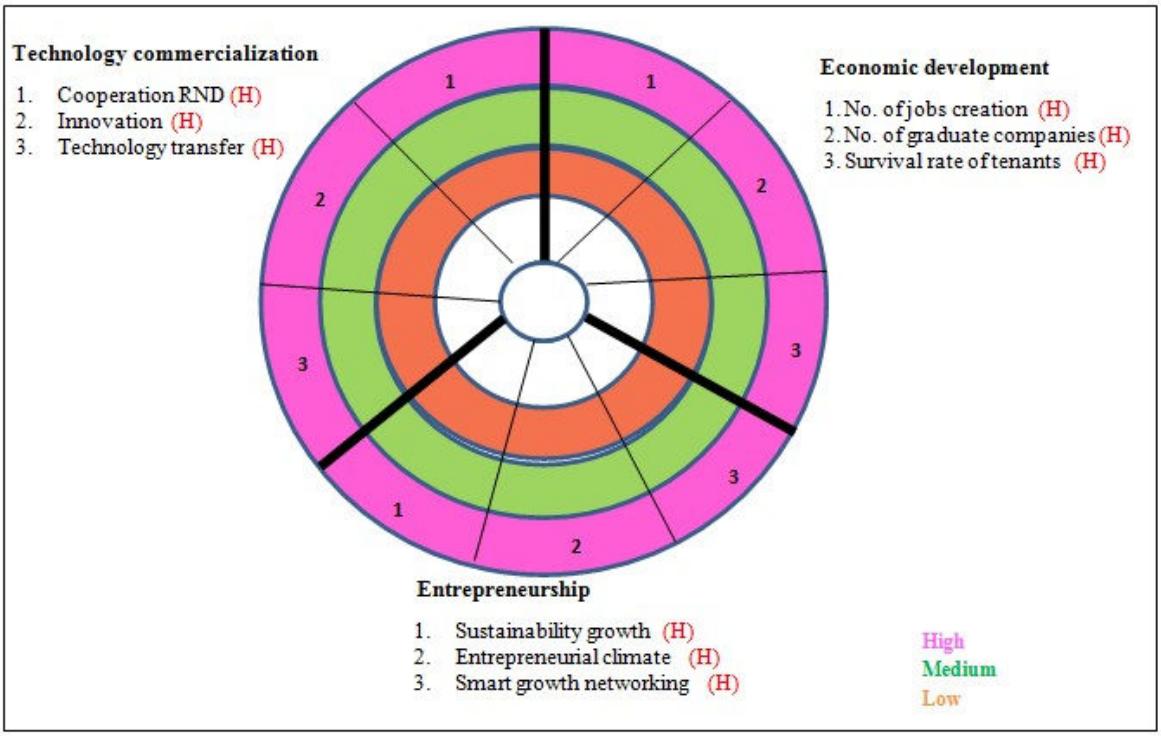

Chart 3: Radar Chart

Key indicators	High (100%)	Medium (80%)	Low (60%)
Technology commercialization			
1. Cooperation RND	100		
2. Innovation	100		
3. Technology transfer	100		
Economic development			
1. No. of jobs creation	100		
2. No. of graduate companies	100		
3. Survival rate of tenants	100		
Entrepreneurship			
1. Sustainability growth	100		
2. Entrepreneurial climate	100		
3. Smart growth networking	100		

Table 1: Summary of Radar Chart