

*The State-of-the Art and Emerging Trends in
Business & Technology Incubation and Acceleration Practices*

Sarfraz A. Mian, PhD

SUNY Distinguished Professor

Entrepreneurship & Management Policy

State University of New York (SUNY)

Oswego, NY, USA

Webinar Presentation to

The OECD Centre for Entrepreneurship, SMEs, Regions & Cities

16 January 2024

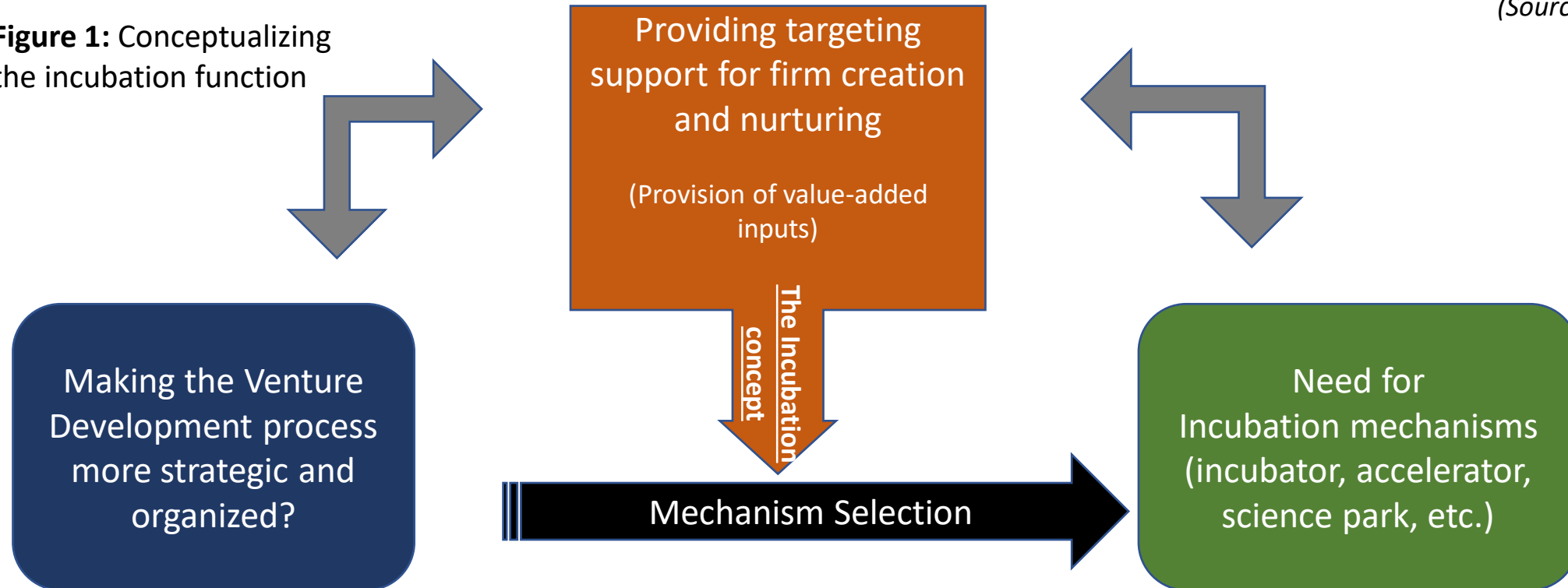
Agenda

- ❑ Understanding business/technology incubation
- ❑ Traditional and newer/emerging incubation models
- ❑ From National Innovation Systems (NIS) to space-based innovation hubs/entrepreneurial ecosystems
- ❑ Role of incubation mechanisms in building sustainable innovation hubs/entrepreneurial ecosystems
- ❑ Conclusion: Implications for national and regional innovation policy.

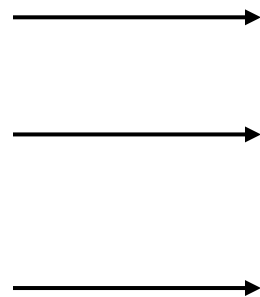
Understanding incubation

- Over the past six decades, BUSINESS INCUBATION has emerged as an established concept for new venture creation and development.
- An array of incubation models exist with traditional models maturing and new models are emerging.
- Multiple theoretical lenses have been used to justify business incubation, however, search for a unified theory continues.
- The research shows the use of *open innovation* and *social capital theory* complement the *resource-based view* as framework to understand incubation (Mian 2021).

Figure 1: Conceptualizing the incubation function



Entrepreneur
Knowledge & Technology
Capital & Coaching



Flow
Flow
Flow
Flow
Flow

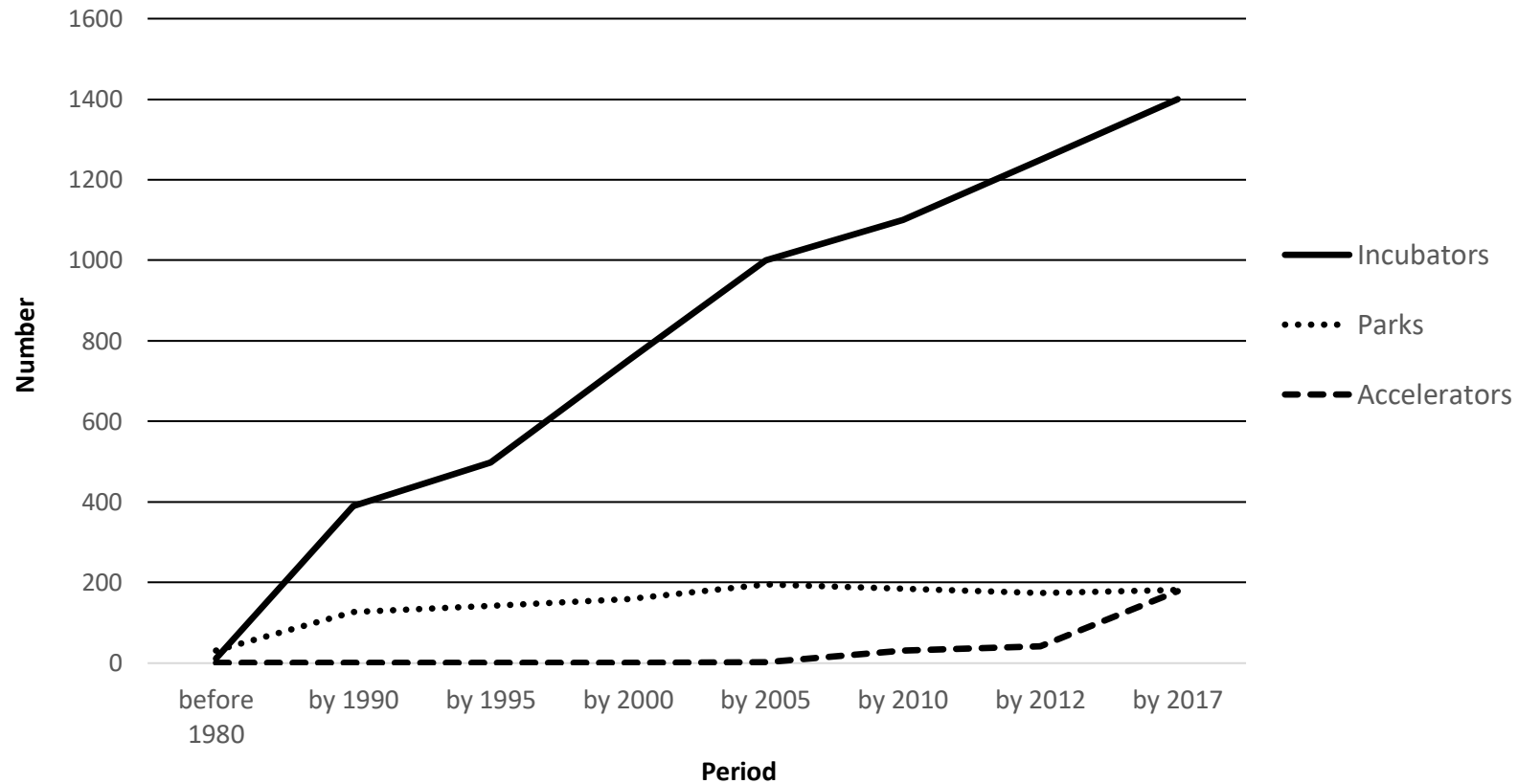


Innovative Firms

Mainstream incubation models

- **Incubators.** A variety of traditional incubators continue to be popular, including general purpose incubators, technology incubators, sustainable incubators, clean technology incubators, space incubators and other specialized models (Mian 2021).
- **Science parks** are attractive to knowledge-based startups due to their proximity to talent and research (university), high value-added services and the perceived image. Successful STPs are drivers of regional innovation through technology transfer (Albahari 2021). They promote partnerships and allocation of labor (Germain et al 2022) and are poles of talent attraction (Cadorin et al 2021).
- **Accelerator** is the newer incubation model popular among fast moving digital and mobile startups. Their design need to be adapted based on tenant types such as deep tech ventures (biotech, engineering) which require flexibility in opportunity selection while minimizing the risks in opportunity execution (Clarysse, 2021) . Y-Combinator, TechStars are considered accelerators. Recent research shows that accelerators reduce uncertainty by determining weather to close early, hence raise less capital, thus managing the venture creation process efficiently (Yu, 2020).

Incubation Mechanisms' Growth in the United States



Pre-incubation Idea development Models

- **Pre-incubation programs** such as coworking spaces, startup cafes, startup weekends, startup campuses, innovation boot camps/challenges, idea competitions and hackathons. They generally do not add much value in terms of entrepreneurial skills development and remain undertheorized. Such well-organized short-term programs are conduits of ideas and serve as feeders to incubation programs (Nair et al, 2020).
- **Coworking model's** adoption by some incubators as a component of their program has enhanced reputation of incubators among angel and VC investors, who now see the incubator-housed or incubator-coordinated co-work as a center of entrepreneurial energy for the entire community (Hochman, 2021).

Other Modern Venture Development Models

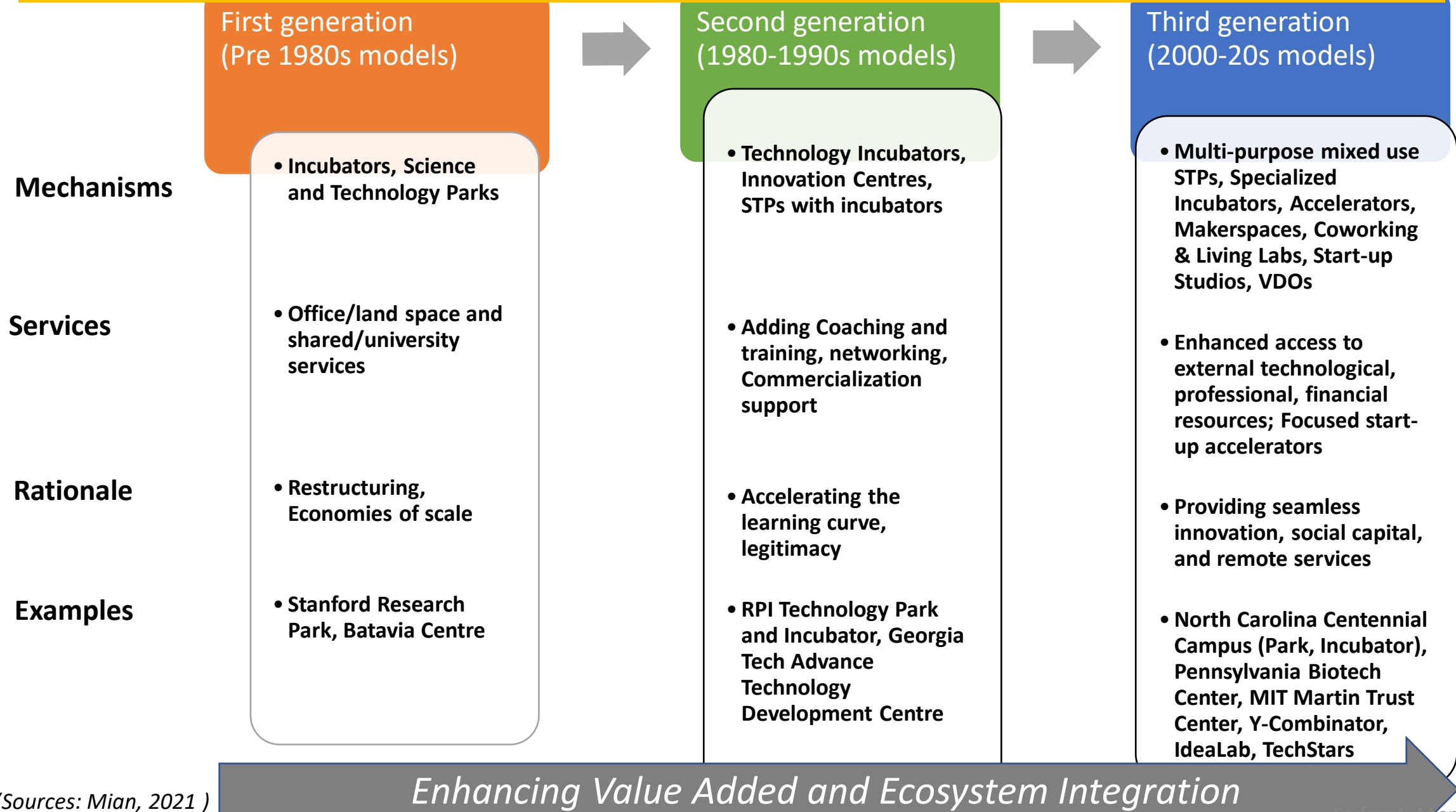
Startup Studios:

Known by different names (*startup factory, startup foundry, venture studio*), is a studio-like platform that aims at building several companies in succession from internal as well as external ideas. The **IdeaLab** established in 1996 presented the first startup studio model, which started getting popular around 2008. Today there are well over 100 known startup studios across the world (about half are in Europe). They focus on providing human capital, business and financial support and access to networking.

Venture Development Organizations (VDOs):

VDOs provide **investment capital** as well as **business mentor network** without the existence of a physical incubator space during the high-risk seed and early stages. Building on the framework and track record of well-established VDOs, the U.S. Department of Commerce Economic Development Administration (EDA) introduced the Regional Innovation Accelerator Network (RIAN) in 2010 to map and promote VDOs nationwide. <https://regionalinnovation.org/>

The Historic Emergence of Incubation Mechanisms



(Sources: Mian, 2021)

Popular Incubation Mechanisms:

Value Added Inputs

Incubation Mechanism Type	Venture Location	Shared Services	Business Services	R&D, Tech Facilities	University /Res Lab Connection	Mentoring /Coaching	Access to Venture Funds
Business Incubator	on-site, around 3 yrs.	Yes	Limited	No	No	Possible	Limited
Mixed-use /general purpose Incubator	on-site, around 3 yrs.	Yes	Yes	Limited	Possible	Possible	Limited
Technology Incubator/ Innovation Center	on-site, 3-5 years	Yes	Yes	Yes	Yes	Yes	Yes
Science/Technology Research Park/ Technopolis	on-site, longer-term /ongoing	Possible via incubators	Yes	Yes	Yes	No	Yes
Accelerator	usually on-site, 3 months	Yes, using cohorts	yes	yes	possible	Intense mentoring	Yes
Pépinières and Hatcheries	on-site around 3 yrs.	Yes	Limited	No	Possible	limited	Possible
Virtual Incubator	No	Limited	Limited	No	No	no	Possible
Co-Working Space	On-site	Limited	Limited	No	No	No	No

(Sources: Mian, 2016)

Incubation mechanisms & venture development phases

PHASE 1: <i>Pre-Incubation/Idea development</i>	PHASE 2: Incubation and acceleration	PHASE 3: Post-Incubation consolidation and Growth
	<i>Development Incubator / Mixed Use Incubator</i>	
<i>German Innovation Center/Technology Incubator</i>		
	<i>Science Park / Research Park</i>	
<i>French Research/Academic Incubator</i>	<i>Pépinières and Hatcheries</i>	<i>Technopolis</i>
<i>Virtual Incubator/ Accelerator</i>		

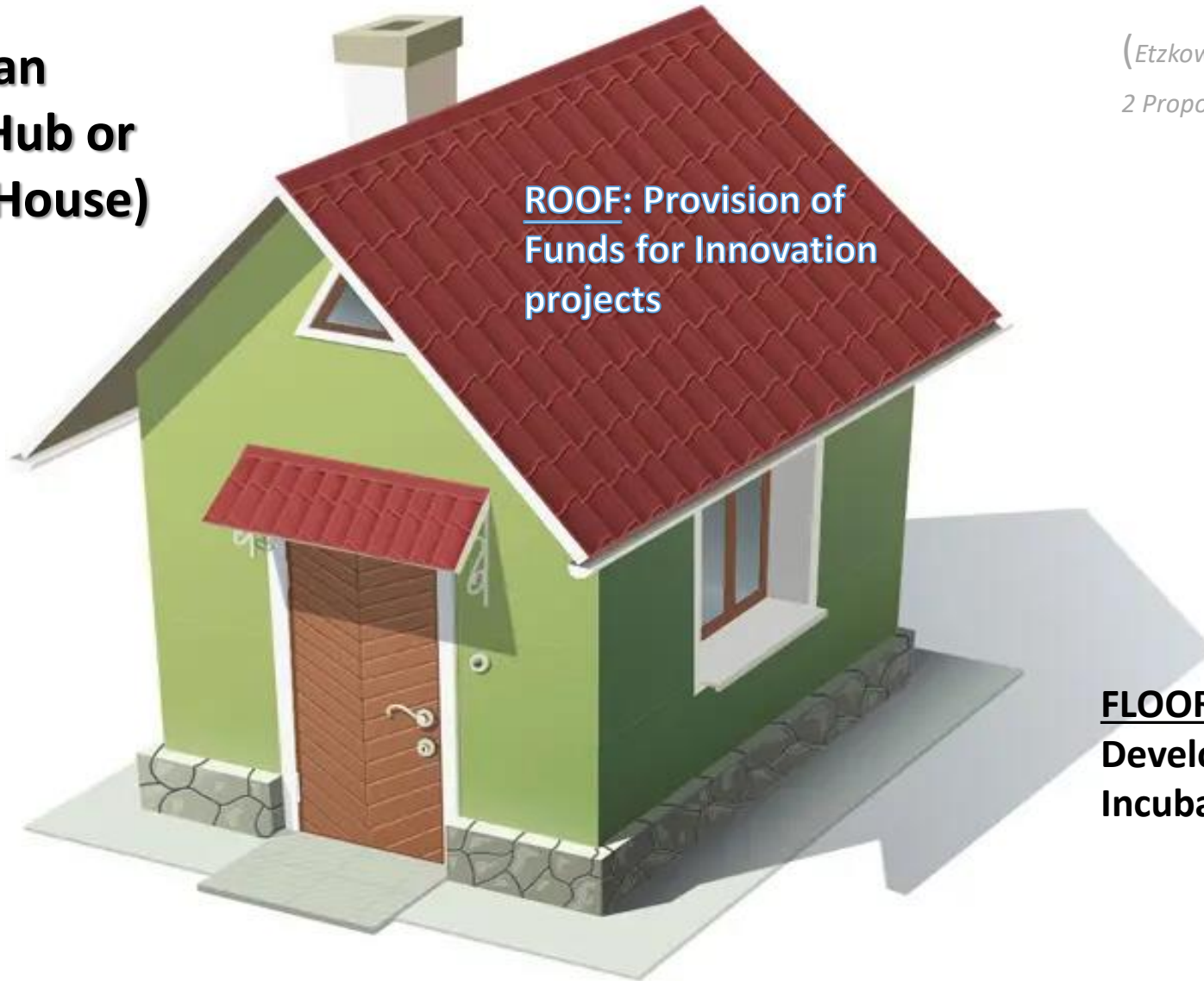
(Adapted from EU 2002)

Incubation and innovation ecosystem (hub) development

- The recent emphasis on ecosystem building approach merges the National Innovation System (NIS) literature (focusing on structures, institutions, etc.) with entrepreneurship literature (studying entrepreneur, opportunities, and start-ups), and highlights the role of context and other open innovation initiatives (Moore, 1993). In this scenario of building dynamic innovation/entrepreneurship ecosystems, we will more generally benefit from a variety of intermediate organizations with a key role of incubation mechanisms (Mian, 2021).
- Given that elements of an entrepreneurship ecosystem are interconnected and over-lapping, it is difficult to isolate any component and find directionality of inputs. The ecosystem is a dynamic mega-incubator comprising of individuals, ventures, institutions, and resources (Rice & Noyes 2021).
- Unlike a *research focused* or *knowledge focused* ecosystem, *innovation focused* ecosystem primarily emphasizes new *firm (start-up) creation and growth (firm development)* (Haukipuro, 2023). Hence a prominent role for incubation mechanisms.

Developing an Innovation Hub or Ecosystem (House)

(Etzkowitz, Mian, Zhou (2022) NSF Engines Type-2 Proposal, Mian, S. Principal Investigator)



ROOF: Provision of Funds for Innovation projects

PILLARS:
Strategy - Selected Innovation Strands

FLOOR: Venture Set-up, Development Support via Incubation Mechanisms

FOUNDATIONS: Partnerships Development via Network Analysis & Consensus Building (Syntegration)

Impact of Digitization & Remote Work

- The incubator model may be changing significantly with regards to remote work. Many incubators are already using digital technologies e.g., SMAC (social media, mobile, analytics, cloud) for recruiting, business support and networking (Chan et al 2022).
- The Digital Innovation Hub (DIH) programs for start-ups and SMEs - deploy digital technologies, such as Artificial Intelligence, (AI), data analytics, 5G, blockchain, Virtual Reality (VR), and Augmented Reality (AR) to ease the negative consequences of the Covid-19 in the space-based incubation industry (EU 2020)
- One of the key barrier to the widespread use of digital services to start-ups was on the part of the entrepreneurs being unable or unfamiliar with virtual technology. The pandemic has certainly changed that across communities, as more incubator managers and client entrepreneurs were forced to learn the use and see the benefits of virtual communication.
- However, the space-based incubation industry is most likely to shift toward digitally supported remote work and develop an optimal mix of service modes after we get out of the recent pandemic effects.

Conclusion

- Incubators today serve as the **focal points for innovation and entrepreneurship** in their communities. They have emerged as a popular and widely used approach to support innovation oriented entrepreneurial development. It is **broadly-tested and relatively low-cost approach** for a strategic and well-informed economic development policy for pursuing regional socio-economic goals (e.g., promoting circular-economy).
- The traditional incubation models of incubators and science parks are maturing and an array of *new models such as accelerators, start-up studios, and pre-incubation idea generation platforms* are emerging. This poses challenges of overlapping objectives and functions and make definitions and assessment challenging.
- Multiple theoretical lenses have been used to understand incubation and the search for a unified theory continues. There is however a convergence of scholars to use **open innovation** and **social capital theory**, complemented by the **resource-based view** as framework to understand and justify modern incubation.
- With the popularity of the ecosystem concept, business incubators are taking on a greater role in entrepreneurship ecosystem development, but debate continues over whether, how and in what situations they are effective. **Adaptation to the local context emerges as the key to success.**
- New entrepreneurs often underestimate the importance of intangible resources, such as knowledge of business functions and social capital, which are generally provided by incubation support.
- **Accelerators are effective in risk reduction and managing the startup process more efficiently (particularly for digital and IT firms).**
- **Science parks increase innovation activities around research universities and promote economic growth more strategically.** They facilitate the formation of regional partnerships and allocation of labor, promoting ecosystem objectives.
- In response to the COVID-19 pandemic, many business incubators have pivoted to digitally supported virtual programming in order to continue to serve their entrepreneurs. The DIH (Digital Innovation Hubs) programs have popularized in Europe to support start-ups and SMEs. The trend is on the diminishing use of space and shift to remote delivery of services with digital technology which is expected to continue.

LATEST PUBLICATION – April 2021

HANDBOOK OF RESEARCH ON Business and Technology Incubation and Acceleration

This pioneering work explores both the theory and practice of business and technology incubation and acceleration over the past six decades as an approach to new venture creation and development. With a global scope, the *Handbook* examines incubation concepts, models, and mechanisms, providing a research-based analytical foundation from which to understand the emerging role of modern incubators, accelerators, science parks, and related support tools in building modern entrepreneurship ecosystems for promoting targeted economic development.

Featuring contributions from internationally renowned scholars and practitioners, the *Handbook* covers four major themes: understanding incubation and acceleration; incubation mechanisms and entrepreneurship ecosystem development; national and regional incubation policy studies; and incubation practice and assessment. Chapters investigate the expanding importance of newer models and novel modes of new venture support such as smart launching through focused training, mentoring, and financing.

This *Handbook* will help to equip policy makers, facility and program managers, investors, and entrepreneurs with the knowledge to handle support for future business and technology ventures more confidently and effectively. It also provides a deeper understanding of the incubation approach for researchers and scholars of entrepreneurship, innovation, and economic development.

Sarfraz A. Mian is Professor of Entrepreneurship and Management Policy and Chair of Management and Marketing Areas in the School of Business at the State University of New York, Oswego, USA, **Magnus Klofsten** is Professor of Innovation and Entrepreneurship in the Department of Management and Engineering at Linköping University, Sweden and **Wadid Lamine** is Associate Professor of Entrepreneurship in the Telfer School of Management at the University of Ottawa, Canada.

Edward Elgar
PUBLISHING

The Lyptatts, 15 Lansdown Road, Cheltenham, Glos GL50 2JA, UK
Tel: + 44 (0) 1242 228934 Email: info@e-elgar.co.uk
William Pratt House, 9 Dewey Court, Northampton, MA 01080, USA
Tel: +1 413 584 5551 Email: elgarinfo@e-elgar.com
www.e-elgar.com www.elgaronline.com



HANDBOOK OF RESEARCH ON
Business and Technology
Incubation and Acceleration

Sarfraz A. Mian
Magnus Klofsten
Wadid Lamine



HANDBOOK OF RESEARCH ON Business and Technology Incubation and Acceleration



A Global Perspective

Edited by
Sarfraz A. Mian • Magnus Klofsten • Wadid Lamine



Sarfraz A. Mian, OECD Webinar 16

January 2024

ombdesign

CONTACT: Andy Omer JOB NO: 3355 DATE SENT: 15.10.2020 TITLE: Handbook of Research on Business and Technology Incubation and Acceleration EDITOR: Caroline Cornish
PRODUCTION: Caroline Cornish, Rebecca Williams, Pauline Thomas, Simon Thomas, Jennifer Bell, Reference/PIC: Zakia Khan, Elizabeth Collins, CMYK
EMAIL: andy@ombdesign.co.uk PLEASE NOTE: Colours on printed laser proofs may differ slightly to those viewed on PDFs, due to the nature of laser printing, compared to the colour values seen on screen.



Science and Technology Based Regional Entrepreneurship

Global Experience in Policy and Program Development



Edited by Sarfraz A. Mian

Science and Technology Based Regional Entrepreneurship

Sarfraz A. Mian



Science and Technology Based Regional Entrepreneurship

Providing a global survey of public policies and programs for building national and regional ecosystems of science and technology based entrepreneurial development, this book provides a unique analysis of the advances, over the last several decades and in light of the experiential knowledge gained in various parts of the world, in the understanding of innovation systems in the pursuit of developing these economies. Presenting nineteen case studies of diverse developed and emerging economy nations and their regions, more than thirty expert authors describe an array of policy and program mechanisms that have been implemented over the years.

The in-depth analyses of the worldwide efforts featured in this volume provide the reader with several valuable lessons. There are clear indications of a trend toward better cohesion and coordination of national efforts to improve innovation but also a trend toward the broadening of regional agendas to address technology, talent, capital, innovation infrastructure and entrepreneurship culture issues – considered essential for knowledge based entrepreneurial growth. The book also offers a unique treatment of grassroots level programmatic aspects of these efforts, including some novel entrepreneurial mechanisms employed for policy implementation.

The book's blend of theory and practice provides valuable insights to the reader, particularly government, academic and private sector policymakers and scholars researching or involved directly with efforts to build and support the development of science and technology based entrepreneurial regions.

Sarfraz A. Mian is Professor of Strategic Management and Entrepreneurship in the School of Business at the State University of New York, Oswego, USA.

EDWARD ELGAR: A FAMILY BUSINESS IN INTERNATIONAL PUBLISHING

The Lyptatts, 15 Lansdown Road
Cheltenham, Glos, GL50 2JA, UK
Tel: +44 (0) 1242 226904 Fax: +44 (0) 1242 282111
Email: info@elgar.co.uk

William Pratt House, 9 Dewey Court
Northampton, MA 01060, USA
Tel: +1 413 584 5561 Fax: +1 413 584 9983
Email: elgarinfo@elgar.com
www.e-elgar.com

ISBN 978-1-84720-390-8



9 781847 203908

TECHNOLOGY ENTREPRENEURSHIP AND BUSINESS INCUBATION

Theory • Practice • Lessons Learned

Technology Entrepreneurship and Business Incubation analyzes business incubators worldwide through a series of empirical and theoretical papers. The authors examine the extent to which business incubators are influential in situations such as nurturing young technology firms, increasing success of new firms, and in developing an ecosystem around these successes. Also examined is the relationship between business incubators and their resource providers, including venture capitalist firms and government agencies.

Edited by Phillip Phan (Johns Hopkins Carey Business School), Sarfraz Mian (State University of New York at Oswego), and Wadid Lamine (Toulouse Business School), all leading figures in the field, this book provides both a theoretical framework to conceptualise ideas and a practical guide to influence best practices and innovation in business incubators.

TECHNOLOGY ENTREPRENEURSHIP AND BUSINESS INCUBATION

Phan
Mian
Lamine

TECHNOLOGY ENTREPRENEURSHIP AND BUSINESS INCUBATION

Theory • Practice • Lessons Learned



Editors

Phillip H Phan • Sarfraz A Mian • Wadid Lamine

Imperial College Press

www.icpress.co.uk



Imperial College Press

Sarfraz A. Mian, OECD Webinar 16

January 2024



Building Knowledge Regions in North America

Focusing on emerging technology regions of the US, Canada and Mexico, the authors provide an analysis of firms' innovative activities, how contacts, national systems of innovation, knowledge regions and incubator mechanisms. An overview of the evolution of each region over the past quarter century is presented, along with an evaluation of the effectiveness of science parks and technology incubators in various regional and national environments.

Though the three countries studied share the same continent and have well-developed trade relations, the significant differences between them in level of development, industrial infrastructure, education, and systems of innovation provide insight into the successes and failures of select knowledge regions. The authors find that areas with a solid industrial base benefit best, but do not necessarily require formal technology incubator mechanisms to evolve into successful innovation poles. In contrast, remote regions with good research capacity, and those with an average industrial research base, must develop an entrepreneurial culture and close cooperation between universities, industry and government with formal incubator mechanisms serving as focal points.

Scholars of innovation systems, technology policy, entrepreneurship and regional development will find this fascinating study of great interest, as will science and technology policymakers, university officials and regional leaders.

Leonel Corona is Professor of Economics of Innovation at the National University of Mexico. Jérôme Doutriaux is Professor of Management in the School of Management of the University of Ottawa, Canada and Sarfraz A. Mian is Professor of Strategic Management and Entrepreneurship in the School of Business at the State University of New York, Oswego, USA.

BOWARD B.C.CAS PUBLISHERS
Ottawa, Ontario, Canada
Ottawa, Ont. K1P 1Y4, CA
Tel: +1 (613) 837-3881 Fax: +1 (613) 837-3877
Email: info@bward.com
100 River Street, Suite 202, Burlington, ON L7R 4A6, CA
Tel: +1 (779) 339-8881 Fax: +1 (779) 339-8882
Email: info@bward.com
www.bward.com

Building Knowledge Regions in North America

Leonel Corona,
Jérôme Doutriaux,
Sarfraz A. Mian



Building Knowledge Regions in North America

Emerging Technology Innovation Poles



Leonel Corona, Jérôme Doutriaux, Sarfraz A. Mian



Special Issue Section on
Incubators and Regions
Volume 43, issue 5, October 2018

Issue editors:

Sarfraz Mian, Wadid Lamine,
Alain Fayolle, Mike Wright

There are 12 articles in this issue

Additional Journal References:
Special Issues on Technology Business Incubation

Technovation (2016)



International J Entrepreneurship & Innovation Management (2011)





Thank You!

Questions?

Sarfraz A. Mian, OECD Webinar 16

January 2024