Stimulating the Growth of Technology-Based Incubators: Government as Enabler

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Abstract

Business incubators have long been considered an important aspect of new venture creation, and an effective means of fostering new jobs within an economy. Despite Australia being an early adopter of business incubators, government's investment has declined over the last decade. This has left Australia lagging behind other nations, including China, where incubation has been an area of considerable investment in recent years. One of the most prominent problems in China is unbalanced regional development and to solve this problem, Technology-Based Incubators' (TBIs) have emerged to narrow the economic gap between domestic regions. In the last five years, the proportion of TBI's industrial contribution to GDP in China has tripled to 1.126% (Hong, Chen, Zhu & Song, 2017).

As Australia's government has retreated from incubation, the private sector and tertiary sector have stepped forward to facilitate innovation and entrepreneurship and find new paths for commercialisation of emerging technologies. In the absence of a national policy strategy for incubation, there have emerged numerous small and independent incubators with limited assessment of how their operations impact the success of incubatees. Coupled with more attention to business incubators' usefulness in economic development, it is worth revisiting Australian government's role in stimulating technology incubation not as an investor but as an enabler.

This paper explores the comparative role of governments in fostering the advancement of technology through business incubation in Australia and China. It suggests an enabling-oriented approach to government policy and service delivery may stimulate and sustain incubatees' growth via the development of social capital. Government may also play a critical role in policy programs that foster learning, research and innovation.

INTRODUCTION

In the transition from a command to market economy, Chinese governments (National, Provincial and Municipal) have held economic growth as a top priority, and in a top-down process have issued policies to promote China's industrial development (Breznitz & Murphree, 2010). At the same time, Australia has entered decades of consecutive annual economic growth, setting a new record among developed economies for uninterrupted expansion (Austrade, 2019). Australian Government policymakers have played a key role in this economic growth. It is evident that in the last 30 years, the governments of both countries have been committed to building an innovation-driven economy, which includes strong support for the development of Technology Based Incubators (TBIs) across varying industries and regions (The State Council of Peoples Republic of China, 2016; Australian Government, May 2018).

The government remains the key capital investor in business incubation in China. China's State Council officially approved and started the Torch Program, in 1988, to develop hi-tech industrial zones and science parks in China (Liu et al., 2017). Although numerous policies have been implemented during the preceding decades, such as the National Science and Technology Industrial Parks and the Innovation Fund for tech-based small to medium enterprises (SMEs), the Torch Program continues to be the driving force for growth in business incubation in China (Cao, Simon & Suttmeier, 2009; Heilmann, Shih & Hofem, 2013; Li, Chen, & Gao, 2019).

In a fast-developing economy, the central government of China emphasises the importance of TBIs to progress the indigenous innovation strategy (Armanios, Eesley, Li, & Eisenhardt, 2016; Huang, Audretsch, & Hewitt, 2013; Hussler, Picard, & Tang, 2010; Sutherland, 2005). China's indigenous innovation strategy is a series of government investment and industrial policies designed to transform the economy to be a science-based and technology-oriented industry (Cao et al., 2009). However, the incubating efficiency of these Chinese government-sponsored non-for-profit TBIs has been found to be low, as they are heavily dependent on government financial subsidies, need to satisfy political demand from government and lack specialised capabilities (Barbero, Casillas, Ramos & Guitar, 2012; Chandra & Fealey, 2009; Harwit, 2002; Lalkaka, 2002). Since 2011, having realised these problems, the Chinese government has been reducing financial subsidies and urging non-for-profit TBIs to become self-sustaining. By the end of 2018, there were 4,849 TBIs in China, and the total number of Chinese entrepreneurial

incubators reached 11,808, the business incubation industry remains a steady development trend (THTIDC, 2019).

Business incubation history indicates that Australian governments (Federal, State and Local) were early adopters of business incubation programs, with governments investing in the creation of business incubators from the mid-1980s (Kemp, 2013). As a result, organisations delivering entrepreneurship education grew in number, size and scope in Australia. Many of these programs use a variety of pedagogical techniques to teach participating entrepreneurs a broad spectrum of content (Maritz & Brown, 2013) despite little evidence of the efficacy of these programs (Rae, 2012). The Australian Federal Government interest in business incubation began in 1991 with the creation of a funding scheme to generate community-based, not-for-profit business incubators with the aim to create jobs (ANZABI, 2004, Schaper & Lewer, 2009). Subsequently, the Government invested $50 million (AUD) in the scheme over the next 15 years (ANZABI, 2004). Investment in technology specific business incubators became more evident in the early 2000's with the Federal Government establishing the Building IT Strengths (BITS) incubator funding scheme in 2001 (ANZABI, 2004; Kemp, 2013). The aim of the funding was to encourage technology start-ups to remain in Australia. According to Business Innovation and Incubation Australia (BIIA) the 'burn-out rate' of the BITS program was a major contributor to the government's retreat from program funding incubation without replacement income being generated from incubated companies (incubatees). In the absence of government, the private sector and tertiary sector were expected to step forward and invest in technology-based incubators (Burnett, 2009; Kemp, 2013; von Zedtwitz, 2003). More recently, start-up businesses in Australia rely on a combination of government and private investor programs, as well as tertiary sector assistance (DCITA, 2005).

Technology-based business incubators (TBIs), which are the dominant organisations fostering the development of new technology-based firms (NTBFs), have become universal (Bergek & Norrman, 2008; Chan & Lau, 2005) and evolved from an affordable leasing facility with shared office services to performing a critical role in economic development objectives such as job creation and industrial restructuring (Kemp, 2013). This means TBIs have expanded services to include access to networks, business coaching and funding provisions (Bruneel, Ratinho, Clarysse & Groen 2012). According to Mrkajic (2017) business incubators take care of the

necessary internal resources to shelter the incubated ventures from potential risks stemming from external impacts.

This paper considers how governments in China and Australia have changed from predominantly direct investors to enablers of business incubation, by implementing policies and strategies to generate a thriving environment, programs and services to build the capacity of incubators and regulation to safeguard entrepreneurs. It suggests a shift in policy from direct investment to enabling resources from across industry sectors to stimulate and sustain incubatees' growth via the development of social capital. Social capital is the value embedded in social relationships of individuals or collectives (Adler & Kwon, 2002; Payne, Moore, Griffis & Autry, 2011) and enables firms to link with customers, suppliers and other actors within the business incubation ecosystem.

THE CHANGING ROLE OF GOVERNMENT IN BUSINESS INCUBATION IN CHINA AND AUSTRALIA

Where governments have been the forerunners for business incubation investment and have failed to succeed, the failure has been linked to inept or counterproductive allocation of funds and financial subsidies, as well as to established businesses making use of the funding schemes that were intended for new and emerging entrepreneurs (Lerner, 2010). These findings have encouraged governments to shift their incubation policies from direct investment in start-ups to enabling strategies as a perceived way to more effectively and efficiently use government funds to improve incubatee success.

The role of government in Technology-Based Incubators in China

Prior studies suggest many effects and issues for the role of government in TBIs in China. These effects include: local government acceptance for implementation of policies and programs, an increase in research and development (R&D) financing to stimulate the growth of small business and using TBI's as a way to balance regional economic development.

Under China's unitary government system, after the central government introduces policies or programs, the provincial and municipal governments implement and control them. In the history of China's incubators from 1987 China's Ministry of Science and Technology (MOST)

has played a significant role in guidance, organisation, funding and promotion of TBIs at every stage in the incubation process through the Torch Program (Hong, Chen, Zhu & Song, 2017; Sun, 2003). The Torch Program's main objective for TBIs is to improve the management and operation of technology enterprises and technology entrepreneurs and accelerate commercialisation of scientific achievements (Sun, 2003; Li et al., 2019). The Chinese government involvement in the establishment and operation of incubators is typically high, with the government impacting incubator models, organisation structure, funding and strategy for the incubator (Scaramuzzi, 2002). According to Sun (2003) the varying effectiveness in local government policies to support the development of incubators, and complications in implementing policies, are making it difficult to achieve the projected regional economic balance. This has been worsened by the unequal spread and equity ownership of TBIs across China. For example, the eastern region has the vast majority of TBIs followed by midland, and then the west (Hong et al., 2017). Incubators in the southern regions, such as Shenzhen, tend to have mixed ownership structures (public/private) and are more likely to make direct investments in incubators. In contrast, the incubators in the north, with heavy government involvement, tend to maintain an arm's length financial relationship with TBIs (Chandra, He & Fealey, 2007).

China's innovation strategy to improve the role of SMEs in the economy coupled with increased research and development (R&D) financing and launching new high-tech industries has brought positive results (Reshetnikova, 2018). In the last five years, the proportion of TBI's industrial contribution to GDP (in China) has tripled to 1.126% (Hong et al. 2017). The growth in TBI's has contributed to bridging China's technology gap globally and narrowing the economic gap between domestic regions (Hong et al., 2017). Compared with Australia, China's TBIs are still in early stages of development.

The role of government in Technology-Based Incubators in Australia

In the middle to late 1980s, the Federal Government of Australia responded to the growing need for job creation by funding the establishment of business incubators, to assist people to start their own small businesses. Australia was an early adopter of business incubation (ANZABI, 2004; Burnett, 2009) and the Federal Government continued to invest substantially in technology business incubation through the Building IT Strengths (BITS) incubator funding scheme, established in 2001. The funding was largely used to create 10 TBIs across the country

with the purpose of cultivating technology start-ups in Australia and thereby ensuring that Australian innovation and ideas remained in Australia (ANZABI, 2004, Kemp, 2013). The government funding of the BITs program was originally due for completion in 2003-04, but early evaluation found that additional longer-term investment would be required to prevent incubators collapsing. As a result, the second round of funding was invested but only in the better performing incubators (DCITA, 2005). The program was eventually discontinued in 2008 (BIIA, 2008) with one of the critical factors in the demise of the program reported to be the "burn rate" of government funding by the BITs incubators, without replacement income being generated from incubated companies (Kemp, 2013). To improve business capability and commercialisation performance, the Australian Federal Government, shifted its policy investment to an Entrepreneur's Program, a network of experts to help businesses solve problems, rather than focusing on firm-specific financial assistance (Office of the Chief Scientist, October 2015). InnovationAus (2019) reported that the 2018 review of the Entrepreneurs Program resulted in changes to improve the focus on the outcomes of business growth, innovation and commercialisation.

As the government has retreated from incubation, the private sector and tertiary sector have intervened, with universities in Australia playing a much larger role, accounting for 31 percent of GERD (Gross Domestic Expenditure on R&D) (OECD, 2018; OECD, 2017). Due to Australia's lack of strong innovation leaders in TBIs and the weakness of market mechanisms in leading, stimulating and supporting TBIs in times of technological and market disruption, the government is forced to play a stronger role as an enabler of resources. A PricewaterhouseCoopers (PwC) study, commissioned by the Australian Government, identified that technology start-up incubators could contribute over A$100 billion of additional Gross Domestic Product (GDP) by 2033 if the number of high-impact entrepreneurs increases by a factor of 20 and with improved support by the start-up ecosystem. The government has an important role in bridging this gap (Office of the Chief Scientist, October 2015).

COMPARATIVE ANALYSIS

This comparative analysis explores literature available on the Chinese and Australian governments' policies and strategies that are intended to generate a thriving incubation

environment, including the types of service programs aimed at boosting industries capacity to grow as well as regulation to safeguard incubation outcomes.

National-Federal level polices and strategies, service programs and regulation for TBIs

The Peoples Republic of China governs business incubation at a national level through the Administrative Measures for Technology Incubators policy guidelines controlled by the Ministry of Science and Technology (MOST). MOST offers direct subsidies to attract more incubators to register and support the long-term local economy. There are also taxation preferences and deductions for the for-incubation industry from all levels of government. At the national level, according to the announcement of China State Taxation Administration in November 2018, the incubators are exempt from value-added tax, property tax and land holding tax from January 1, 2019 to December 31, 2021. The non-profit incubators are also exempt from corporate income tax. In contrast the Australian Government through the Federal Department of Industry Innovation and Science takes a facilitative approach to business incubation through the Entrepreneurs' Programme. The policy emphasis is to improve the prospects of Australian start-ups achieving commercial success by helping them to develop their business capabilities. (Australian Government, May 2018). The policy is targeted, stipulating that grant funding be limited to Incubators in regional areas and/or sectors with high potential for success in international trade, to boost the effectiveness of high performing incubators and to encourage incubators to work with more data-driven start-ups that use public data as part of their business. This targeting has prompted a perception of abandonment of incubation support at a national level.

According to MOST, the Chinese national government is drafting specifications of services to support technology business incubators (MOST, 2019). The draft includes programs and services such as; housing and property service, commerce and administrative service, venture consulting, intermediary service, technical support service, networking service, investment and financing service and equity investment service.

At a national level the Australian government's Entrepreneurs' Programme offers practical support including, advice from experts with relevant private sector experience, co-funded grants to commercialise new products, processes and services funding to take advantage of business improvement and connection and collaboration opportunities (Australian Government, May

2018). Other support services include Expert-in-Residence and Innovation Facilitator initiatives that aim to increase the capabilities of business incubators and the likelihood of commercial success for incubatees in international markets by providing access to expertise in research, management and technical skills (Australian Government, May 2018).

National regulation for TBIs places emphasis on safeguarding intellectual property rights and encouraging commercialisation. The Chinese government legislates for intellectual property rights by administering Trademark Law, Copyright Law, Patent Law and Law Against Unfair Competition of the People's Republic of China. Similarly, Australia has laws that advance commercial protection for TBIs such as; Property Laws, Patent Protection, Trademark Protection, Registering a Domain Name, Design Protection and Copyright Protection.

Provincial – State and Municipal – Local approach to policy, service programs and regulation case examples

Provincial governments of China and State governments of Australia often take a unique approach to business incubation, based on current and emerging economic contexts. This section of the paper contains case examples from China and Australia of policy, service and regulation that illustrates a variety of approaches used to boost technology-based incubation in response to environmental conditions. The municipal-local governments of the capital cities in the province-state examples are included as this level of government is often charged with interpreting and implementing the policies and services initiated at national and state levels.

The chosen case examples are Jiangsu, Sichuan and Hubei in China and New South Wales, Victoria and South Australia in Australia. These case examples were chosen based on their comparative level of incubation maturity and their capital cities' innovation global rankings in 2019.

Table 1 summarises the fiscal, demographic and innovation statistics of the case examples. It shows a summary of facts for each province and state, as well as each one's place and share in the country's economy. The three provinces of Jiangsu, Hubei, and Sichuan represent the highest levels of economic development in eastern, central, and western regions of China respectively, and their levels of development of TBIs and related innovative industries. Although the China governments' main approaches to TBIs differ (see description further

below), they all present a need to improve their global innovation rankings. The two states of NSW and Victoria represent Australia's highest level of economic and innovative industry development while South Australia, despite being a relatively small economy, has as its capital city, Adelaide, which won a spot in the world's top 21 smart cities (Halliwell 2019) with Adelaide's "Silicon Valley" – Lot Fourteen Program. Based on the comparison data of the six capital cities, including Innovation global ranking and differing stages of incubation maturity, China still has a long way to go and could learn from Australia's experience.

Table 1. Key facts about the comparative case examples

	Jiangsu	**Hubei**	**Sichuan**	**New Sales Wales**	**Victoria**	**South Australia**
Level of Incubation Maturity	Mature	Developing	Young	Mature	Developing	Young
Gov's main approach to incubation	Performance-based	Cooperative	Capability Building	Cooperative	Capability Building	Directive
GDP/ GSP[1]	¥9259.54B	¥3936.66B	¥4067.81B	A$ 614.41B	A$ 446.08B	A$ 107.99B
	U$ 1317.07B	U$ 559.95B	U$ 578.60B	U$ 418.86B	U$ 304.11B	U$ 73.62B
GDP/GSP Ranking in the Country	2	7	6	1	2	5
Share of National Economy	10.28%	4.37%	4.52%	32.70%	23.36%	5.84%
Population Size	80.51M	59.17M	83.41M	8.07M	6.57M	1.75M
GDP per capita	¥115,168	¥66,616	¥48,883	A$ 76,361	A$ 68,350	A$ 61,965
	U$ 17,404	U$ 10,067	U$ 7,387	U$ 52,040	U$ 46,581	U$ 42,229

[1] RMB/USD and AUD/USD are subjected to the historical exchange rate of 20th Nov 2019

Innovation Global Ranking[2]	269 (Nanjing)	243 (Wuhan)	307 (Chengdu)	15 (Sydney)	11 (Melbourne)	154 (Adelaide)

Source: Official website National data 2018 by National Bureau of Statistics of China/ Official website data by Australian Bureau of Statistics 2018-19/ Innovation Cities™ Index 2019: Global

Incubation Approaches

Government's main approaches to incubation, assigned by the titles, Performance-based, Capability Building, Cooperative and Directive as in Table 1, are outlined below and illustrated in the case examples. A performance-based approach stresses government's accountability for the performance and achievement of predetermined objectives resulting from government funding allocation and operations (European Union, 2013). Capability building approach is derived from the fundamentals of a public policy approach to community capacity building that in this instance enables TBIs to solve their problems and build their capacity through leveraging the interaction of human capital, organisational resources, and social capital (Chaskin , 2009; Noya, Clarence & Craig, 2009). A cooperative approach relies on Public–Private Partnerships (PPPs) which are loosely defined as cooperative institutional arrangements between the public and private sectors and are often used to undertake financially constrained projects, where the participants of the cooperative bring something of value to the partnership such as skills, knowledge and resources (Hodge & Greve, 2007). In the top-down (directive) approach, the government acts more like a planner and directly involves itself in the incubation process. A directive approach is often used when there is a desire and urgency to activate economic markets rapidly (Sun et al., 2019).

Performance-based Approach – Jiangsu, China

Jiangsu is an eastern-central coastal province of China. It pursues a performance-based approach as illustrated by its TBI policies, services and regulations.

Policies

The overarching government policy is the 'Administrative Measures for Jiangsu Provincial Technology Business Incubators'. The purpose of the policy is to act as a guide for high-quality development of the province's technology business incubators, creating a sound environment

[2] Ranking data from the capital cities of each province/state

for the growth of technological enterprises, encouraging the development of entrepreneurship and innovation, and accelerating the construction of an innovation-oriented province. The Provincial Science and Technology Department conducts hands-on management for provincial incubators and carries out performance evaluations based on the incubator evaluation index system. For the enterprises that failed to pass in two consecutive evaluations, the qualification of the provincial-level TBIs will be cancelled.

Services & Programs

Government services are managed by the 'Action Plan for Science and Technology Finance Support Jiangsu Province Incubators' which coordinates investment and financing services for TBIs, administers programs to develop the TBIs' capacity, and nurtures the healthy development of technology start-ups.

Regulations

Established in 2018, the TBIs are protected by 'Provincial People's Government of Issuing the Working Measures for Outbound Transfer of Intellectual Property Rights'. This regulation safeguards national security and significant public interests, including the Hi-tech industry development, and regulating the order of outbound transfer of intellectual property rights (for Trial Implementation). The Nanjing Municipal Government supports Jiangsu Province's evaluative approach to governing TBIs. Using the 'Some Policies and Measures for Deepening the Construction of Famous Municipality of Innovation to Enhance the First Position of Innovation', the municipal government ensures adherence to strategic guidance, strengthening the driving force for reform, focusing on 'cracking the barriers, structural contradictions and policy issues' that restrict innovative development.

At the municipal level

The Nanjing Provincial Government's 2018 'Measures for Implementing the Cultivation of Nanjing Municipality Innovative Enterprises' strengthens the incubation of science and technology SMEs by providing services based on the specific needs of entrepreneurs and tracks the process from the start-up stage to the growth stage and then to the mature stage. Incubators are required to value and report on the performance of the start-ups within the TBIs.

Rationale for labelling as a Performance-based Approach

Based on the above description, Jiangsu Province is identified as using a performance-based approach, giving weight to the evaluation of business incubators against key performance indicators attached to government-directed investment. Poor performance results in the operations of a specified TBI ceasing.

Source: Official website of the Science and Technology Department of Jiangsu Province/ njrc.gov.cn

Capability Building Approach – Sichuan, China

Sichuan Province's policy, service and regulation approach to the southwest region of China aims to build technology infrastructure as well as capability development through attracting talented people as a way to advanced science and technology.

Policies

Established in May 2019, the 'Opinions of Sichuan Provincial Committee of the Communist Party of China and People's Government of Sichuan Province on Accelerating the High-quality Development of Tianfu New Area' is building a location (the Tianfu New Area) for promoting market openness of the inland economy. This includes a High-tech Innovation Center for high-level overseas talent and to promote mass entrepreneurship and innovation ('Building Chengdu-Hong Kong Youth Innovation and Entrepreneur DreamWorks').

Services & Programs

The Detailed Implementation Rules of Sichuan Province for Innovative Product Project (for Trial Implementation) encourages enterprises to go beyond standard technologies and develop and promote new innovative products and ensure the protection of associated intellectual property rights.

Regulations

'Regulations of Sichuan Province on Promoting the Transformation of Scientific and Technological Achievements' were instigated in January 2019 to fully implement the innovation-driven development strategy, promoting the transformation of scientific and

technological achievements into real productive forces, standardizing such transformation, and facilitating economic and social development.

At the municipal level

Chengdu Municipal Government: Has expanded upon the provincial government strategy through the 'Policy for Supporting Returned Talents come to Chengdu for Entrepreneurship and Employment'. This is a strategic policy for attracting overseas high-level talents to become involved in entrepreneurship and innovation in Chengdu. To build on the capacity for talented people to work in Chengdu, coupons are provided to foster R&D via the 'Measures for the Administration of the Implementation of Chengdu Science and Technology Innovation Coupon'. The coupon is a kind of certificate that allows access to Chengdu's applied technology research and development funds to support technology enterprises to carry out research and development activities or purchase technology services without compensation.

Rationale for labelling as a Capability Building Approach

In Sichuan Province, where economic conditions and financial bases are not as strong as those in the eastern coastal region, various levels of government have introduced a range of policies and measures to promote the skills, knowledge and resources of business incubators to self-manage and to draw on resources from TBI networks.

Source: Official website of Science and Technology Department of Sichuan Province/ Chengdu Science and Technology Bureau

Cooperative Approach – Hubei, China

Hubei Province, located in central China, takes a cooperative approach between the public and private sectors with an emphasis on the government's fiscal responsibility, safeguarding patents and commercialisation of products and services.

Policies

Since August 2018, the Hubei government policy, 'Implementation Opinions of the People's Government of Hubei Province on Further Stimulating the Vitality of Private Investment and Promoting the Sustainable Economic Growth', has been promoting the consistent private

investment in Hubei Province through public private partnerships (PPPs) and drawing on social capital (actual and potential resources derived from the networks of relationships possessed by individuals or social units) (Nahapiet & Ghoshal, 1998).

Services & Programs

'Several Opinions of the Hubei Province People's Government on Further Optimizing the Business Environment' aims to establish a world-class business environment through internationalization and commercialisation. The program administers a "bank-taxation", "bank-merchant" cooperation platform, expanding access for Small Medium Enterprises (SMEs) in Hubei Province to secure innovative products and services.

Regulations

Hubei Province Patent Regulation, established in 2017, improved the system for patent creation, application, protection, management and service in Hubei Province and drives Hubei province's intellectual property strategy. It promotes the full integration of science and technology with economic and social development research through patents.

At the municipal level

Wuhan Municipal government: 'Wuhan High-tech Enterprises Training for Three Years (2019 – 2021) Action Plan' supports the Provincial government's emphasis on commercialisation policy by managing training to build high-tech start-ups in clusters of enterprises beginning with incubation and cultivation, then identification and finally benchmarking. Reinforcing the provincial government's fiscal responsibility strategy, Wuhan municipal government administers the 'List of Policies for Increasing Investment in Science and Technology and Enhance Innovation Capabilities'. The program's focus is increasing protection of private investment through policies, funding, land and/or infrastructure. 'Measures for the Administration of Wuhan Municipal Science and Technology Plan Project and Technology R&D Fund' is used to manage the use of the fund.

Rationale for labelling as a Cooperative Approach

Based on the above description, after clarifying the boundaries of accountability, governments at all levels in Hubei Province creatively stimulate the sustainable growth of TBIs through cooperation between the public and private sectors and using the Public-Private Partnerships.

Source: Official website of Science and Technology Department of Hubei Province/ Wuhan Science and Technology Bureau

Capability Building Approach – New South Wales, Australia

The New South Wales (NSW) government's approach to incubation is illustrated by its recent policy to develop cooperative incubation hubs and build a collaborative innovation space in the centre of the city of Sydney.

Policies

The Sydney Start-up Hub is an innovation centre aimed at establishing the city as Australia's start-up capital. The city-based hub aims to attract 2,500 incubator tenants, although not all will be technology based incubatees. The Hub also offers community and events spaces, collaborative workspaces and a Regional Landing Pad.

Services & Programs

The NSW Boosting Business Program includes six Knowledge Hubs to facilitate cooperation between business, research organisations and industry associations, to share information and collaborative projects. It is an example of a government initiative enabling collaboration between the public and private sectors, to deliver infrastructure in an agile and responsive way to support the start-up ecosystem.

At the municipal level

The cooperative approach of the NSW government is emphasised in the 'Tech Startups Action Plan' established by the City of Sydney in 2016. The plan, adopted by Council on 27 June 2016, is designed to address the needs of individual tech start-ups as well as to take a collaborative approach to assist with organisations to launch and scale, such as partnering with accelerators and incubators. The City of Sydney Startup Innovation funding (2019) also supports the development or implementation of new technologies or processes that are currently not being used in the local market but have the potential to improve environmental sustainability.

Rationale for labelling as a Capability Building Approach

Similar to Hubei Province, some of NSW's policies and project plans and initiatives promote collaboration between the public and private sectors. However, as Australia's largest economic state, NSW is more focused on shaping the infrastructure with advanced facilities for a start-up ecological network to stimulate growth of TBIs, rather than giving funding support to incubatees.

Source: Official website of City of Sydney Council/ Sydney Startup Hub by NSW Government

Capability Building Approach – Victoria, Australia

The Victorian government's approach to TBIs emphasises capability building through business incubators and start-up hubs as a way to transform the economy from traditional manufacturing to a digital economy.

Policies

LaunchVic, a new entity created to increase start-ups, drive new ideas and create jobs in Victoria works in partnership with entrepreneurs, industry, business, the community and educational institutions to strengthen Victoria's entrepreneurial and startup ecosystem. Its focus is to improve capability and scale up. Funding allocation is based on collaborative initiatives that encourage the clustering of destination hubs that are more likely to build capacity and connectedness within the startup community.

Services & Programs

Building capability through advocacy, education programs, mentoring, events, 'hackathons', competitions, improving access to venture capital and start-up ecosystem mapping. Launch Vic also provides research and information for decision-support for local governments' funding of grants to TBIs in their city.

At the municipal level

The City of Melbourne's Start-up Action Plan 2017-21 builds on the capability approach of the Victorian Government LaunchVic strategy by enhancing and extending the existing services for start-ups and incubators, by developing new services, based on the consultative processes used to collect ideas for the plan. Through the City of Melbourne Accelerator Program (COM

X), launched in July 2019, in partnership with RMIT (Royal Melbourne Institute of Technology) Activator and Hub Australia to present CoM X, the city of Melbourne helps start-ups increase presence in the market, grow their network and achieve early stage traction for their business.

Rationale for labelling as a Capability Building Approach

Based on the above description, Victoria promotes the development of TBIs in the state through an entity LaunchVic. Its advocacy, strategy, financial support and a series of activities are aimed at building the capacity of Victoria's start-up ecosystem as a whole, thereby providing indirect support for incubatees (Victoria State Government, 2019).

Source: Official website of LaunchVic by Victorian Government

Directive Approach – South Australia, Australia

South Australia is in the southern central area of Australia. The South Australian Government's approach to TBI policy, service and regulation involves a directive approach with commitment of both State and Local government to create a technology precinct that facilitates TBIs activity.

Policies

The Business Incubation policy in South Australia is administered under the direction of the 'Renewal SA' policy, an integrated approach to urban development. The key TBI initiative within the Renewal SA Policy is called FIXE @ Lot Fourteen, an urban planning destination with a business incubator ecosystem of entrepreneurs, academics and businesses in the technology sectors.

Services & Programs

At FIXE, entrepreneurs are supported with programs to develop their ideas, businesses are encouraged to explore new technologies, investors identify opportunities to back emerging and growing businesses, and successful entrepreneurs can mentor future entrepreneurs.

At the municipal level

The City of Adelaide's provides very limited direct programs, rather it offers some co-working space and connects entrepreneurs with the State and Federal Government start-up programs. It is worth noting that the City of Adelaide Smart Cities Plan aims to increase Aboriginal and Torres Strait Islander employment and business opportunities as part of a whole-of-government initiative to improve Indigenous economic participation (Aboriginal Entrepreneur Hub (AEH) (Oct 2019)). The AEH will offer a range of free programs designed to bolster First Nation participation in South Australia's start-up sector. The AEH was also established in conjunction with the Adelaide City Deal – a 10-year plan designed to foster South Australian innovation and its accompanying workforce.

Rationale for labelling as a Directive Approach

Based on the governments' desire to activate TBI's rapidly as a way to grow the South Australian business economy, the State and local government authorities take a directive approach that focusses on building an urban start-up precinct and facilitating a business incubation ecosystem using incentives.

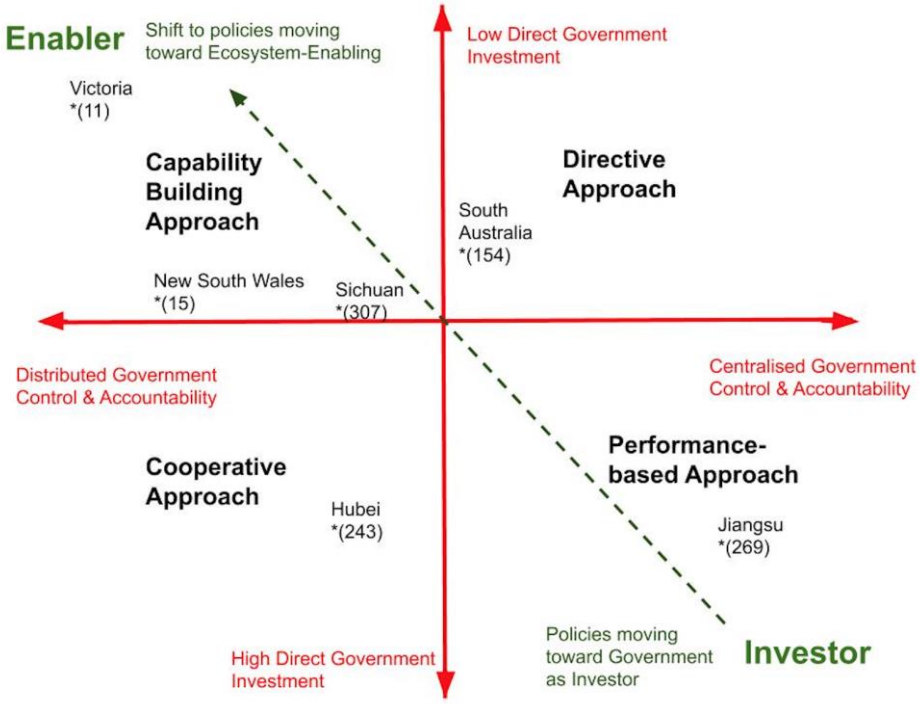
Source: Official website Renewal SA/ Supporting Business in South Australia/ FIXE by Government of South Australia

The different approaches to simulating TBIs may be plotted against their respective levels of flexibility and levels of government investment, as illustrated in Figure 1. The horizontal axis represents the degree of centralised government control and accountability: when the point on the horizontal axis moves to the right, local and state governments rely more on implementing the policies of the national/federal government to stimulate the growth of TBIs; when the point moves to the left side, local governments have greater flexibility to stimulate TBIs through their own innovations and methods. The vertical axis represents the degree of intensity of government direct investment: when the intensity of government direct investment is lower, that is, towards low direct investment, the risks to government are reduced, and the policies towards TBIs are more likely to continue, and vice versa.

The 45-degree dotted line suggests a shift over time toward government strategies with lower direct investment and a high distributed accountability between levels of government, incubators, incubatees and other actors in the incubation ecosystem to stimulate incubation,

labelled by the authors, as Enablers. The movement is from government strategies emphasising direct invest in the operations of business incubators and centrally governed incubation stimulation, labelled by the authors, as Investors. The shift may be related both to the higher risks to government from direct investment and to the pressures involved in local government's control by superior governments. When the case examples are placed in their respective descriptors together with their global innovation ranking, it is noteworthy that the Enabler stimulation strategies appear to have higher Global Innovation Rankings than those that emphasise Investor stimulation strategies.

Figure 1. Derived from the Case Examples: Government Stimulation Typologies



* Innovation Global Ranking (Source: Innovation Cities^{TM} Index, 2019)

Source: Authors assessment

Summary of comparative changes to the role of government in business incubation

Given Australian governments' success in shifting toward an enabling-orientated approach to policy and strategy (partly as a result of funding 'burn-out') and Australia's ability to maintain high Global Innovation Ranking, the Chinese governments' policy stimulation model may consider following the reduction in direct investment path that Australian governments have taken in terms of stimulating business incubation. However, given its authoritarian style to

public policy, the Chinese government is unlikely to withdraw its control or move away from government resource allocation, and it may be even strengthened in future development stages. This presents the risk of distortion of the value of the allocated resources and unsustainability of the stimulation for TBIs. To address this risk, the Chinese government may bear in mind a move to a more distributive public administration and delegate additional power to provincial and local governments based on controlling key resources, as well as extending the market-orientation, thereby mobilising collective cooperation and improving the sustainability model of the incubators.

CONCLUSION

Governments kick-started business incubation as an investor to stimulate the growth of TBIs and technological development but seems to be transitioning to enabler to create a more sustainable environment for the incubators and emerging enterprises. The comparative analysis suggests that the provinces and states of both Australia and China that are in the early stages of business incubation, use their investor status to direct policies and services but this may not be sustainable as demonstrated by the history of more mature incubation states and provinces which are shifting to a more resource efficient model of enabler. In this enabler approach, the government focuses more on mobilising the private and tertiary sectors to invest in the research, development and commercialisation of technology. In this way a cooperative model that builds capability for business incubation can emerge that leverages expertise and resources across industry sectors.

Figure 2. Toward an Enabling-Orientated approach to Business Incubation

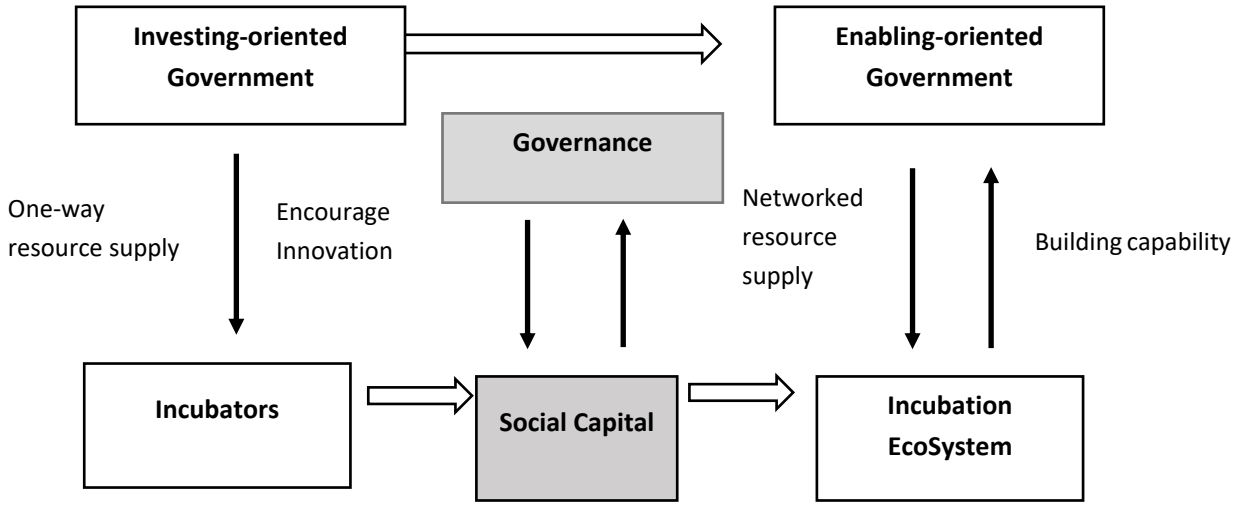


Figure 2 illustrates that the evolution in government approaches to incubation leads to a distributive enabling-oriented approach to government policy and service delivery which according to Gedajlovic, Honig, Moore, Payne & Wright (2013) strengthens incubatees' capability to sustain growth through resource sharing and solidarity leading to social capital development. Social capital helps firms connect with customers, suppliers and other actors, within the business incubation ecosystem, to galvanise valuable resources. The implication for policy in Australia is to build capability and facilitation of these supply networks. In China this is likely to mean deepening the reform of decentralised governance and taking more advantage of private finance and markets. Governments in both countries may eventually withdraw from the direct investment and operation of the TBIs and focus on enabling social capital to drive the sustainability of business incubators. In this way social capital can increase solidarity among actors in the network collective that would be otherwise unattainable, which ultimately should increase the likelihood of sustainability (Gedajlovic etal., 2013).

To fulfil this policy direction and develop social capital, TBIs should be encouraged to expand their incubation services by focusing on facilitating internal and external networks. Through these networks, start-ups access intangible resources such as knowledge and legitimacy (Bruneel et al., 2012). This shift in focus supports the observation that leveraging networks and intangible resources assists start-ups to achieve sustainable growth (Bliemel et al., 2016).

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