

# POLICY TO IMPROVE THE EFFICIENCY OF INCUBATION SERVICES AT TECHNOLOGY INCUBATORS TO PROMOTE THE DEVELOPMENT OF SCIENCE AND TECHNOLOGY FIRMS IN VIETNAM

To Hong Duc, Hanoi Metropolitan University

## ABSTRACT

*The concept of Technology Business Incubators (TBIs) and Science & Technology (S&T) firms have appeared in Vietnam for more than ten years. TBIs are essential in transferring scientific research results to completed products in several developed countries. TBIs also help establish S&T firms combined with a business idea to provide high-quality products to society. However, incubation services S&T firms are using from TBIs in Vietnam have not been evaluated comprehensively yet. Therefore, this article focuses on sharing some findings and observations regarding the current situation of providing business incubations services of some TBIs in Vietnam. Additionally, assess the legal framework and policies to support TBIs and S&T firms in Vietnam, then give some recommendations for TBIs and the government to improve the efficiency of incubation services and promote the progress of S&T firms.*

**Keywords:** Technology Business Incubator, Science and Technology Firms, Entrepreneurship, Commercialize Research Results, Technology Transfer.

## INTRODUCTION

In the national innovation system, enterprises, especially Small and Medium-sized Enterprises (SMEs), show their essential role in connecting the Government to Research and Development (R&D) organizations (Universities, research institutes) and the market. The SMEs in the developing countries, including Vietnam, seems to lack the resources to scale up and develop effectively. These countries have found many difficulties while innovating SMEs, creating job opportunities, and benefiting from this model. Many studies have shown that technology business incubators have effectively innovated and created new S&T firms.

The business incubator is a comprehensively designed model to support and create favorable conditions for startups and newly established businesses. Besides, it helps S&T enterprises develop through shared services, training, financial support, equipment, and workshops. Incubator activities have made new opportunities for strengthening the links of SMEs with domestic and foreign partners. The business incubation model has established a coherent business service system instead of single service support models. Through business incubators, together with the establishment of information sharing systems, the linkages between incubators and other stakeholders have been strengthened, contributing to improving operational capacity competition for businesses in the context of integration. It is also an essential component of the entrepreneurial ecosystem (Smith, 2001).

According to the National Business Incubation Association, there had been about 7,000 business incubators (as of October 2012). The USA has about 1,250 incubators (in 1980, there were only 12 incubators). In 2001, TBIs in the North America area supported 35,000 S&T firms

generating over \$7 billion in revenue. The cost to create a new job in a TBI was \$1,100 compared to \$10,000 outside. It was estimated that \$1 invested in incubators and incubated S&T firms would generate around \$30 in sales tax. The survival rate of the incubated companies is over 90%, which is very high compared to the 20% of the enterprises that can stand after three years outside the incubator. Europe also has over 1,200 incubators that create around 30,000 new jobs every year (Al-Mubarak et al., 2013).

According to the National Agency for Technology Entrepreneurship and Commercialization Development (NATEC) data, as of 2018, Vietnam has about 51 Technology Business Incubators (TBI). 21 TBIs are named as technology business incubators, 30 organizations have the function of incubating S&T firms. In recent years, Vietnam's TBI ecosystem has appeared some prominent names such as Vietnam-Korea Incubator; Vietnam Silicon Valley; Center for Innovation and Business Incubation-Nguyen Tat Thanh University; Technology Startup Ecosystem-Vietnam National University of Ho Chi Minh City; National Center for Technology Progress-NACENTECH; Rehoboth-Innovation Hub. (Dao & Pham, 2017).

However, the possible conditions to provide services such as management, infrastructure, facilities, financial support capacity, and business environment for technology business incubation activities are still limited. Therefore, this article studies the current situation of providing incubation services at Vietnam's TBIs. Besides that, the authors want to analyze the limitations on TBIs' service capacity, find out limitations in policies for supporting the development of TBIs, and finally, supposing some recommendations in promoting TBI activities in Vietnam.

## LITERATURE REVIEW

### Definition of Technology Business Incubators

According to the United Nations Industrial Development Organization (UNIDO, 1999), "*Technology Business Incubator (TBI) is an organization that systematically conducts the process of creating new businesses, providing them with a comprehensive system and enjoys services to operate successfully.*" TBIs do not necessarily include all equipment and services, but through a combination of external service providers' resources to ensure that businesses in TBI can operate.

In the "*Manual on the Technology Business Incubator,*" UNESCO (2000) stated that TBI aims to create technology-focused firms. In essence, a TBI is an environment. University with a management team, providing space, sharing equipment, consulting, training, specific information for selected businesses, accessibility to university studies, integrated financial and technical support services at an affordable cost. This TBI's characteristic is carefully choosing the potential S&T firms, supporting the business plans preparation and access the capital funding, training management skills in small firms; after the incubation period, the successful firms can be graduated and leave the TBI.

The United Kingdom Business Incubation (UKBI, 2003) defined "*incubation is the physical manifestation of the process that encourages people to begin to form and develop a business, providing for that business resources for success and creating an environment for business growth.*"

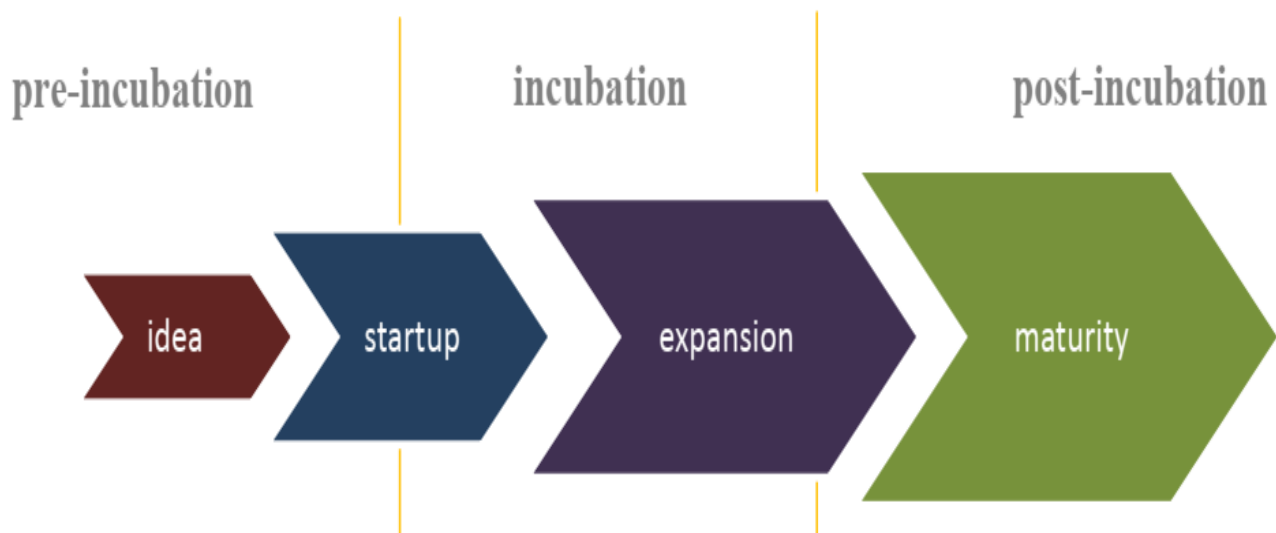
Paying great attention to TBI, UNESCO (2006) continued to publish *"Technology Business Incubation: A toolkit on Innovation in Engineering Science and Technology."* In this book, TBI is defined as a toolkit that provides incubation services to the selected S&T enterprises and entrepreneurial teams in S&T projects at the beginning stages to support them commercialize their research results and establish sustainable spin-off or startups firms.

In Vietnam, the terms *"Technology Incubation"* and *"Technology Business Incubation"* have appeared in legal documents since 2006 by Technology Transfer Law (TTL). TTL was edited and updated in 2017. Clause 12, article 2 of TTL 2017 stated that *"Technology Incubation is the process to create, complete, commercialize technology from an idea or research result or incomplete technology by activities such as supporting necessary technical infrastructure, resources, services."* Moreover, Clause 13, article 2 indicates that Technology Business Incubation is the establishment and development of S&T enterprises through supporting necessary technical infrastructure, resources, and services.

### Process of Business Technology Incubation

Clause 13, Article 2 of TTL 2017 about Technology Business Incubation stated that: *"Science and technology enterprise incubation is the process of forming and developing it through various activities support with necessary technical infrastructure, resources, and services."* During this period, S&T firms will receive full support from the TBIs for facilities and business organizations to overcome the initial difficult period and develop steadily (usually lasting 1-3 years).

In the report *"Mixed-use Incubator Handbook: A Startup Guide for Incubator Developers,"* Davies (2009) pointed out that it is necessary to understand the startup cycle of business to know about incubation activities. This process is included three stages: pre-incubation, incubation, and post-incubation Figure 1.



**FIGURE 1**  
**START-UP CYCLE OF A BUSINESS** (Davies, 2009)

Table 1 below describes specifically the roles of these stages.

<b>Germinate</b> Pre-Incubation	Pre-Incubation is the very earliest stage of intervention, where it helps an individual with an idea. Some incubators can afford this kind of activity where they can access public support or private risk capital. It is often required in high-tech innovation industries and with incubators closely attached to Universities. Sometimes this innovation comes out of need rather than an opportunity and is very risky.	Expensive Risky Public
<b>Incubate</b> Incubation	Incubate stage is where an idea has graduated to a plan, with a team, and operations have begun. Incubators can help refine the plan, build the team, provide resources, and invest in the company. It is also a relatively early intervention before the company is profitable. Companies are often not able to pay for services and assistance in general. Also known as ' <i>acceleration</i> ,' this focuses on more mature startups (Companies can pay for services and need targeted assistance).	Startups Expensive Part subsidized
<b>Host</b> Post-Incubation	Post-incubation is where a profitable company merely seeks a particular type of facility. An incubator requires no intervention, but we include it here as we feel many incubators act as hosts to some companies for a while. This relationship with mature companies can be a crucial strategy to assist with and subsidize their other programs.	Mature Safe

Source: (Davies, 2009)

### Definition of S&T Firms

Recently, a variety of concepts have been used to define S&T firms. For example, businesses rely on new technologies (Autio, 2017; Fontes & Coombs, 2001); new technology-based enterprises (Dahlstrand, 1999); SMEs are technology-intensive (Keeble et al., 1998); High-tech SMEs (Oakey, 1991); startups units that develop new products based on knowledge and skills embodied in the engineering and natural sciences (Candi & Saemundsson, 2011); Small and new enterprises which have strong R&D activities (Maine et al., 2010). The authors use the concept of S&T firms around the keywords: new knowledge enterprises, new enterprises, independent enterprises, technology-intensive enterprises, and small and medium enterprises. It is essential to note the concept of "new" with various interpretations. Some authors apply the term to refer to technology newness (Fontes & Coombs, 2001) or adapt it to entrepreneurship (Rickne & Jacobsson, 1999). Most of the studies use the term "new" to denote both startups and technological novelties.

Therefore, understanding S&T enterprises as academic satellite enterprises (spin-off/spin-out), knowledge-based, science-based, technology-based enterprises (high, new, small and medium, standalone) is commonly used. Founders of S&T enterprises are entrepreneurs, scientists, or scientists who hold technological know-how capable of creating new products and services with fast growth potential.

For State documents of Vietnam, Article 2 of Decree No. 96/2010/ND-CP dated September 20, 2010, of the Government, S&T firm is understood as an enterprise whose "main activity is the production and business of all kinds of products and from the results of scientific research and technological development, which are legally owned and used by enterprises;

carry out S&T tasks. S&T enterprises produce and trade in other services according to the provisions of law.”; Clause 4, Article 3 of the Law on High Technology stipulates that a high-tech enterprise manufactures high-tech products, provides high-tech services, and conducts high-tech R&D activities. According to points a and b, Article 75 of the Law on Investment and Article 1 of Decision No. 19/2015/QĐ-TTg dated June 15, 2015, of the Prime Minister, a high-tech enterprise is a technology and manufacturing high-tech products on the State's list of high-tech products encouraged for development.

## METHODOLOGY

This study is descriptive qualitative research. The authors used some research methods: document study, in-depth interview, survey through questionnaires for TBIs and S&T firms. The content of the methods is described in detail as follows:

**Document research:** Collecting and analyzing relevant domestic and foreign documents from international, Vietnamese journals and monographs. The document research method is carried out based on documents related to the incubation and development of S&T firms.

**In-depth interviews:** In-depth interviews were conducted with policymakers and implementers, experts on innovation activities, Science and technology managers and representatives of incubators; science and technology enterprise.

**Survey through questionnaires for incubators:** The survey is conducted to give an overview of the current operating status of incubators identifies difficulties in their operation incubators in the current period. The number of incubators surveyed is 30.

**Survey through questionnaires for S&T firms participating in incubation:** This object group includes companies that have been and will be participating in incubators.

## RESULTS AND DISCUSSION

### Experiences in Developing TBI Services of the World

Since the 1980s, TBI has become one of the leading concerns in technology and innovation policy in North America and Europe. Some developed countries in Asia, primarily due to the growing importance of SMEs, especially in the field of S&T. Services provided by TBIs around the world, are intended to help S&T firms exploit and commercialize scientific research results. These groups of services can be divided into (1) Administrative/office, (2) Infrastructure organization, (3) business support, (4) access to finance (financial support), (5) network construction, (6) technical services (such as Supporting education and knowledge access; Branding development support) (World Bank, 2010). The groups of incubation services are explicitly described in Table 2.

As the World Bank (2010) report shows, the function of incubators is to assist companies in completing their projects and make them possible commercialization. TBIs have been providing projects with services to accomplish this, such as:

Assist in the implementation of technology and marketing feasibility studies based on ideas and preparation of R&D plans.

<b>Table 2</b>	
<b>GROUP OF INCUBATION SERVICES DESCRIPTION</b>	
<b>Group of incubation services</b>	<b>Description</b>
Administrative/office	Administrative/office service is a combination of support services for completing the company's central functions performed by other departments. Boards and other departments are in charge. Some of the primary roles of this kind of service are as follow: <ul style="list-style-type: none"> <li>- Acting as the center for receiving, communicating information, and coordinating the firm's operational procedures</li> <li>- Playing a role as the center for planning and controlling daily activities (targets, norms, processes)</li> </ul>
Infrastructure organization	<ul style="list-style-type: none"> <li>- TBIs facilitate S&amp;T firms to rent or access specific facilities such as laboratories, specialized equipment, showrooms, etc.</li> <li>- Infrastructure services can be considered as basic services of a TBI. TBIs may invest in equipment to provide these services or cooperate with universities, research institutes, or other S&amp;T enterprises with R&amp;D departments.</li> </ul>
Business support	<ul style="list-style-type: none"> <li>- Owners of S&amp;T firms always require the technical know-how to be developed and commercialized into highly innovative products.</li> <li>- Support for the management of TBIs starting with evaluation, selecting the firms, and reviewing their business plan. TBIs also support marketing provided by third-party support.</li> <li>- The incubator provides additional support services related to intellectual property advice, transfer, merger, licensing agreement, or these services may be provided from the centers. Consulting centers in universities, businesses, law offices at reasonable prices.</li> </ul>
Financial support	<ul style="list-style-type: none"> <li>- The main task of the TBIs is to minimize the lack of capital for S&amp;T firms in the formation and development stages. This shortage is solved by creating a bridge to access capital sources between S&amp;T firms and financial investors.</li> <li>- TBIs by themselves can also establish a venture capital fund based on attracting their capital or external private capital sources to become an investment channel for S&amp;T firms were incubated</li> </ul>
Community connection and network establishment	<ul style="list-style-type: none"> <li>- Incubators can organize investment forums/conferences, including potential investors and business owners who are using services at TBIs.</li> <li>- Besides that, the TBIs also focus on establishing a network of entrepreneurial communities, including Universities, S&amp;T firms, Incubators, Investors, Researchers, Students. It is essential because it not only shares tangible resources (equipment, human resources, finance) or intangible resources (knowledge) but also promotes the national entrepreneurship spirit, strengthen the capacity and opportunities to interact with the entrepreneurial environment for young people</li> </ul>
Supporting education and knowledge access	<ul style="list-style-type: none"> <li>- TBIs provides training services as an activity to enhance the long-term development capacity of S&amp;T enterprises. TBIs will organize training courses on basic skills related to business management, human resource management, technology management, etc. so that companies can have a solid foundation while running operations. The knowledge resources can also be provided via a library of information on S&amp;T or experts that the TBIs can connect with for S&amp;T firms.</li> </ul>
Branding development support	<ul style="list-style-type: none"> <li>- Brand positioning is the factor that helps companies improve their competitiveness and reach out to customers. However, when SMEs (Including S&amp;T firms) are newly established, they often do not pay attention to this factor, therefore bringing a relatively large cost burden for new firms.</li> </ul>

Assist in recruiting and managing R&D staff;  
 Provide appropriate facilities for the implementation of the project, including plant, equipment, and administrative facilities;  
 Professional guidance, orientation, and management;  
 Secretarial, administrative, maintenance, purchasing, accounting, and legal services;  
 Assist in finding investment capital and preparing for commercialization and marketing plan.

The following authors would like to introduce some experiences of the USA and France in promulgating policies to promote the development of technology business incubation services.

## The Experiences of the USA

In the US, providing complete and comprehensive services has led to the emergence of successful industrial clusters, the formation of specific industry TBIs, and close links with US universities. Some lessons from the US can be summarized as follows:

Firstly, TBI models in the US are very focused on commercialization and marketing, R&D plan, financial accounting. Besides, TBIs in the US have created operation and sustainable development for startups. According to the World Bank (2010), the failure rate of startups with more than five years of operation at TBIs in the US is 6-9%, much less than the rate of 32% of startups that do not participate in TBIs.

Secondly, the organization of TBIs in the US is evident and rigorous, sponsored by individuals or business sponsors. Therefore, many businesses that hire services at TBIs have the opportunity to access venture capital funds. Venture capitalists created the fund, they are carefully selected, and only startups with good growth potential receive funding. Successful TBIs have many S&T firms using the services and are funded by venture capital funds.

## The Experiences of France

The spectacular growth of TBIs in France is mainly due to the government's strong support by introducing favorable policies and operating funding. The guidelines of the French Government help not only TBIs and entrepreneurs but also businesses are participating in the incubation also have financial incentives.

To activate TBIs, the French government strengthened several activities to support businesses in TBI, such as technical and management consulting services, by expanding the scope of service provision and hiring skilled technology incubators.

The French government also professionalized technology incubation management systems, perfecting the selection process by inviting outside experts to participate in selection committees. Selection criteria focus on commercialization opportunities rather than technical competence.

Linking the network of TBIs is also an essential policy of the French government to exchange management information and knowledge. TBIs catalyze to strengthen the partnership between the higher education sector and the industrial sector; while enhancing the establishment of new S&T firms from universities, industry, and research institutes.

In addition, the French government also encourages TBIs to promote the globalization of incubation through international cooperation with foreign TBIs to reach out to global markets.

## Overview of Types of S&T Firms Using Incubation Services at TBIs

Among S&T firms participating in incubation at TBIs Table 3, which were surveyed, the most field of enterprise is information and communication technology, with 221 (33%); the number of hi-tech agriculture is 99 (14.8%); food processing technology accounted for 12.4%. Other fields such as mechanical and automation take up a proportion of 4.8%, and new material technology has a ratio of 4.3%. It can be seen that the field of information and communication technology has many advantages such as fast incubation time, easy success; High-tech agriculture is a field of interest to many individuals/businesses and research organizations.

**Table 3**  
**RATE OF THE FIELDS OF S&T FIRMS PARTICIPATING IN INCUBATION**

Fields of S&T firms participating in incubation	Quantity	Percentage
Information and communications technology	221	33
High-tech agriculture	99	14.8
Food processing technology	83	12.4
Biotechnology	74	11.1
Environmental technology	66	9.9
Multidisciplinary	65	9.7
Material technology	29	4.3
Automation mechanics	32	4.8

Source: (Dao et al., 2018)

Status of incubation support services to promote the formation and development of S&T firms in Vietnam.

### Administrative Offices Services

Office/administrative services are one of the primary business services. The following table is the result of a survey on the level of use of administrative/office services by S&T firms.

Via the survey result, almost TBIs provide administrative, office, and communication support services and firms are interested in using this service. The specific number is as follow:

Administrative services, only 9% of firms participating in the survey do not use it, 42% use regularly, and 49% of enterprises use it occasionally.

Office support services, 49% of businesses use the service sometimes, 44% use it regularly, and not at all.

Regarding communication support services, 11% of surveyed enterprises do not use this service; The frequency is 44%, the occasional level is 45% Table 4.

**Table 4**  
**THE USAGE RATE OF ADMINISTRATIVE OFFICES SERVICES**

Type of services	Frequently used	Occasionally used	Not used
Administrative support	42%	49%	9%
Office support	44%	49%	7%
Communication	44%	45%	11%

Source: (Dao et al., 2018)

### Infrastructure Organization Service

Through the survey result, the service of organizing infrastructure is also used by S&T firms regularly. Mainly the benefits of hiring telecommunications infrastructure, conference rooms, office rooms, and devices because these services are firms' fundamental and essential demand. The infrastructure organization services used frequently by S&T enterprises with the highest proportion are workspaces renting (89.5%) and telecommunications and internet infrastructure (85.3%). Next is office equipment services (83.2%), and up to 65% of TBIs provide warehouse renting service. Generally, about 60% of S&T firms need to use infrastructure organization services Table 5.



<b>Method of Infrastructure organization services</b>	<b>Quantity</b>	<b>Percentage</b>
Rent a workspace	383	89.5
Telecommunications and internet infrastructure leasing	365	85.3
Office equipment rental	356	83.2
Laboratory rental/specialized equipment	347	81.1
Conference room rental/audio-visual equipment	336	78.5
The exhibition hall for rent	309	72.2
Warehouse for rent	278	65.0

Source: (Dao et al., 2018)

### Business Support Services

Besides infrastructure organization services, business support services are also frequently used by S&T firms in TBIs.

The survey results show that the most frequent service used by S&T firms is business models, business strategies, business plans development, logistics, and legal support. The reason why is because when S&T firm's entrepreneurs have an idea for a business, they have not identified problems related to business model development, issues to apply for licenses, and intellectual property. They also need to source raw materials for logistics services to develop and complete products, machinery, and equipment Table 6.

<b>Method of business support services</b>	<b>Frequently used (%)</b>	<b>Occasionally used (%)</b>	<b>Not used (%)</b>
Support to develop business model/ business strategy/ business plans	78.5	17	4.5
Logistics services supports	75.5	18.3	6.2
Legal support (business license/intellectual property registration, etc.)	72.3	22.3	5.4
Support commercialization of technology (finish products/prototypes in line with market needs)	70.1	24.2	5.7
Collect and analyze market/customer data	68.3	24.5	7.2
Consulting on business management	66.5	28.3	5.2

Source: (Dao et al., 2018)

### Financial Support Service

Financing sources for S&T Firms change throughout the life of the business. The financial requirements of S&T Firms and the difficulties in accessing finance change as companies go through different stages of development (Bank of England, 1996). A study by the Bank of England (1996) on financing for S&T Firms concluded that: S&T Firms face more significant financial difficulties than small and medium enterprises. The authors argue that although S&T Firms grew faster, the proportion of unfinanced S&T Firms was higher than that of SMEs in general. To explain this, the authors gave the following reasons: (1) Higher level of

risk; (2) Lower management skills and commercial ability of owners or founders of S&T enterprises; (3) More difficult to assess the prospects of a product or service; (4) Shorter product life cycle; and (5) Higher uncertainty when applying R&D results.

Therefore, participating in incubators is an effective solution to help both individuals and companies access capital, get the knowledge of successful startup businesses, get great consultation on policies, legal, etc.

The survey results of S&T firms who use financial support services are: Services related to finance and access to capital are used frequently (over 80.0%). The ability to access funding and financial skills of businesses is a problem that S&T firms can't solve by themselves. Raising capital through accessing subsidies, government support, or donors has the highest use rate with 91.8%, raising money through approaching venture capitalists (90.2%); and the third is administrative/accounting/financial services (90.0%). In addition, S&T firms also demand capital support from TBIs. However, it has not been met yet Table 7.

There is the fact that the establishment of an incubator's fund has not been carried out, and TBIs have not officially had a venture capital fund yet.

<b>Method of financial support services</b>	<b>Quantity</b>	<b>Percentage</b>
Administration/accounting/finance services	385	90.0
Raise capital through venture capitalists	386	90.2
Access to commercial loans	366	85.5
Access to nonprofit loans	380	88.8
Access to government subsidies, support, donors	393	91.8
Support through the incubator's internal fund	341	79.7
Mobilizing community contributions	325	75.9
Enterprise equitization	333	77.8

**Source:** (Dao et al., 2018)

### **Community Connection and Network Establishment**

Currently, TBIs own and use databases on technology, technology experts, and consultants for incubation activities. Therefore, providing community connection and network establishment opens up opportunities for S&T firms to connect with expert support networks and introduce products to the community. When S&T firms can take advantage of TBI's network database, they will be advantageous in incubation and maturity.

According to the survey results Table 8, S&T firms usually demand to use community connection services and network establishment. Significantly, the connection service with universities, research institutes, businesses, and incubators is the highest with the regular use rate of more than 70%; next is connecting to capital, financial, and supplier/consumer networks (accounting for nearly 70%); The third is to connect with advisors and experts (68%) frequently use. However, TBIs often do not have enough funding to retain experts because of the limited financial resource. Therefore this reason makes TBIs operate inefficiently.

<b>Method of supporting Community connection and network establishment</b>	<b>Frequently used (%)</b>	<b>Occasionally used (%)</b>	<b>Not used (%)</b>
Connect to universities/research institutes/enterprises/government/incubators	70.3	20.5	9.2
Building capital and financing networks (through venture capitalists, sponsors)	68.4	22.5	9.1
Building a network of suppliers/consumers	68.4	24	7.6
Connect to mentors/experts	68.0	24.5	7.5
Building cooperative links with partners	66.5	24.5	9.0
Organize contests	57	25.5	17.5

**Source:** (Dao et al., 2018)

### Services of Supporting Education and Knowledge Access

Through the result of the survey, S&T firms which have used Services of supporting education and knowledge access has the figures as follows:

According to Table 9, TBI's operating models are the same services to support education and knowledge access. 100% of TBIs focus on implementing training programs and intensive market and technology development; 88% organize soft skills training activities. According to Table 9, it can be seen that S&T firms have the most demand to participate in training programs on entrepreneurship with 86.2%, followed by soft skills training courses (82.9%); and E-learning programs (69.8%). The training programs help individuals and companies know the right way to commercialize S&T ideas.

<b>Method of supporting education and knowledge access</b>	<b>Quantity</b>	<b>Percentage</b>
Implement training programs on entrepreneurship	369	86.2
Soft skills training (Presentation, decision-making, teamwork, etc.)	355	82.9
Organizing in-depth seminars on market analysis and technology assessment	305	71.2
Organizing E-learning programs (Online training)	299	69.8

**Source:** (Dao et al., 2018)

### Services of Branding Development Support

S&T firms are interested in researching and commercializing products and building brands of these products to reach the market. However, most incubated S&T firms lack experience in this field. Therefore they need to seek the TBIs' support.

Via the survey data in Table 10, it can be seen that branding development support services are used regularly. Especially, product promotion support reached the highest regularly used rate with 80.1%, followed by product design consultancy and trademark registration (74.3%). Service of building strategy, brand positioning, and building media strategies are also interested by S&T firms (69.4% and 63.8%)

<b>Method of branding development support services</b>	<b>Frequently used (%)</b>	<b>Occasionally used (%)</b>	<b>Not used (%)</b>
Product promotion support	80.1	18.9	0.9
Product design consultancy and trademark registration	74.3	24.7	0.9
Strategy building, brand positioning	69.4	28.3	2.3
Building media campaign	63.8	35.0	1.2

Source: (Dao et al., 2018)

### **Identity Strengths, Limitations for Incubation Services at TBIs in Vietnam**

**Strengths identification:** The operation of TBIs has created initial qualitative changes in providing incubation support services for S&T firms. Incubation services strengthen the network of links between SMEs with each other and with domestic and foreign partners.

In the new context with higher demands from the customer side, TBIs have organized the model of providing asynchronous business service systems instead of single service support models. This model is entirely consistent with the development trend of TBIs and compatible with the models of TBIs in the world. Accordingly, S&T firms are supported by TBIs from the early stages of ideas formation and research product to the establishment and development stages.

In addition, TBIs also become a bridge connecting incubated S&T firms with other entities to create a system network for sharing resources to enhance competitive capacity for S&T firms in the context of international integration.

**Limited identification:** Infrastructure organization services: Currently, S&T firms that participate in incubation in TBIs are limited inland operation. Especially S&T firms in the field of high-tech agriculture usually demand large trial production areas. This limitation negatively affects the R&D activities of enterprises.

*"My company operates in the field of agricultural production, specifically develop, produce and process of edible mushroom and medicinal mushroom. The planting area which TBIs can provide is too small to produce and research new products. It is only enough to make production models. TBI cannot provide the land fund for enterprises to expand production. This limitation makes it difficult for us. We recommend that TBIs planned for establishment be calculated a large enough land area for S&T firms to develop production during the incubation period. In addition, we also hope that the TBIs will have a concentrated agricultural land for S&T firms which completed the incubation period to be hired for long-term production development"* (In-depth interview with a representative incubated S&T firm).

**Financial support services:** The interviewed incubating S&T firms also have a great demand for capital support or access capital resources. However, the monetary fund construction of TBIs has not been implemented because of some legal barriers. There has no venture capital fund which been established by TBIs yet.

*"During business operation, our company has faced difficulties in capital and raising money to scale up to keep up with market demand. Meanwhile, the TBI does not have a fund to support our operation of a business. Despite being supported a lot by TBI in the incubation*

*process, however, due to the need to expand production scale, my company faces many difficulties in capital resources. Asking for support from TBI, however, is not available. I would like to recommend that TBIs need more networks to support businesses in finding investment sources, loans with interest rate support, or business support funds.*" (In-depth interview with a representative incubated S&T firm).

Community connection and network establishment: The operating budget of TBIs is quite limited, leading to not having enough financial capability to maintain excellent and experienced experts. This reason has made inefficient of providing these services.

*"I see that TBIs still lacks mentors who can follow closely, have enough ability to help S&T firms. Their media relationship ability is quite low even can't advertise these TBIs' brand; therefore, how can they help S&T firms promote products? Additionally, leaders of TBIs are not able to connect support networks and ecosystems well enough to help S&T firms and improve operational efficiency"* (In-depth interview with a representative incubated S&T firm).

### **Limitations of the Legal Framework in Supporting Technology Incubation Activities in Vietnam**

#### **Unreasonable regulations on funding sources for the implementation of programs:**

All programs are mainly funded by the state budget, S&T development fund, and social resources mobilizing. These funding sources are not much and will be spent on many other activities and programs. Moreover, these are activities related to venture capital, so it is difficult to carry out settlement procedures after finishing operations under regulations on spending for S&T using the State budget: *"Funding for implementing the program must be used for all purposes and ensure efficiency according to the approved cost estimates and current financial management regulations"* (Circular No.19/2013/TT-BKHCHN). (Dao & Pham, 2017).

**Policies of financial support for TBIs is not much:** No State fund operates as a venture capital fund: Over the past ten years, the State has had several funds to support the market launch of R&D results by state organizations such as The National Foundation for Science and Technology Development (NAFOSTED), the National Fund for Technology Innovation (NATIF)... have contributed to the formation of new firms from the application of scientific research results. However, there is no fund mentioned above operating as a venture fund. At the same time, successful S&T firms in Vietnam were mainly thanks to the financial resources of private and foreign venture capital funds. With the principle of *"conservation of capital"* and complicated mechanisms and procedures, the State organizations could not effectively impact incubating S&T firms in Vietnam. S&T firm incubation is based on venture capital investment with a high or very high-risk ratio as a trade-off for the expectation of benefit. Recently, the activity of *"venture investment"* has never been defined in legal documents, nor does it have a mechanism to manage and encourage the development of *"venture funds"*; *"venture investment organizations"*. Therefore, no venture capital funds have been established in Vietnam. Even foreign investment funds have based their head office in tax havens and only established representative offices in Vietnam. Vietnam's tax laws also do not encourage venture capital activities. For example, Vietnam does not have a Residual Income Tax for individuals who invest in a startup. When they divest their capital, they will be taxed very high for their profitable investment. They cannot deduct expenses investments that generate such profits and are not offset against previous losses. Meanwhile, due to the nature of venture capital activities, the failure rate is much higher than the success rate, only about 3-10% (Thanh, 2017).

In addition, The Criminal Code of Vietnam stipulates "*crime of irresponsibility causing damage to property of the State*", "*crime of illegally setting up a fund*", "*crime of irresponsibility causing serious consequences*" on the regulations on "*preserving and increasing the value of state capital invested in enterprises*" in the Law on State Budget and the Law on Management and Use of State Capital invested in production and business in enterprises have also become invisible barriers for the State to invest in the incubation and development of science and technology enterprises. (Dao et al., 2017).

### **Some Orientations to Mobilize Resources for Incubation Activities to Promote the Development of S&T Firms**

**Focus on developing land infrastructure for TBIs:** The new regulations on priority planning or land use are applied to high-tech enterprises and hi-tech parks. There are no specific regulations on the priority of planning and using land for TBIs. S&T firms participating in the TBIs have much demand to use the infrastructure organization services of the TBIs. However, even the TBIs themselves are limited in land area, especially for TBIs in the field of high-tech agriculture. To remove these difficulties, the State needs to assign localities to make plan TBIs establishment facilities in high-tech agricultural production areas and create a clean land area before calling investment instead of calling investment after assigning enterprises to take care of site clearance cause delay in progress.

**Promoting the public-Private Partnership (PPP) model:** The state financial budget for S&T activities is relatively low (only less than 2% of GDP), while the need for investment in technical infrastructure is tremendous. This problem has made it difficult for Vietnam to spend investment resources on developing and maintaining TBIs. The PPP model will be a lever to enhance the ability to mobilize financial resources both in the public and private sectors and at home and abroad. In particular, the government will ensure preferential policy support. The private sector will play a prominent role in mobilizing, participating, and using resources (finance, human, material, information) to build and establish TBIs. This relationship has both economic and social significance. Additionally, it is a valuable solution to develop a TBI roadmap in the context of globalization and international integration (Dao, 2016).

The next issue focuses on the organizers in the S&T ecosystem to provide resources for S&T enterprises. This ecosystem includes financial providers such as banks, angel investment groups, venture capital firms, and service providers. A key solution is increasing access to finance by increasing venture capital funding. The public sector needs to be actively involved both directly or indirectly in generating multiple venture capital sources for the mixed effect. It includes the establishment of regional venture capital funds, often of a "*hybrid*" form, which combines the money and human of both private and public sectors, under the management of the private sectors (Trinh, 2017).

**Expanding incubation fee collection activities:** Currently, almost all TBIs offer free services to early-stage businesses for a specific time. If the incubated S&T firms can pay service fees, it will help TBIs reduce their financial difficulties. TBIs can provide S&T firms with a cost-effective environment that supports development through periods of intensive training and guidance with experienced advisors and even investments capital contribution in cash. After successful incubation, businesses will agree to return financial contributions after incubation. It will help the incubators have the revenue to improve the quality of incubation services and invest in infrastructure (Thanh, 2017).

Through survey data of more than 400 S&T firms participating in incubation, up to 78% of enterprises are willing to deduct part of their profit to support TBIs. Among that 78% of S&T firms, 48.8% agree to deduct less than 5% of s; 41% agree from 5.0-15%; 9.3% agree about 15.0-50%; only 1% are ready to share more than 50% of the profit.

On average, the profit that businesses are willing to deduct is about 15%. It is a positive signal for incubators, especially for public incubators. Only when operating on a profit-based basis can science, and technology business incubators positively impact competitiveness to improve professional capacity and service quality to support businesses regularly.

**Accelerating the development of virtual incubator services in the context of the Covid-19 pandemic:** The incubator's providing services is facing challenges due to Covid-19 spread. Businesses worldwide, especially S&T firms, have been facing the harsh realities of the Covid-19 pandemic. Online incubation services have become a welcome response, offering great possibilities for hubs to provide their services remotely. Before the Covid-19 pandemic, the virtual incubator model had been practiced as one of the incubator services models. Virtual incubators have advantages over traditional incubators because incubators do not need to have a physical office, and entrepreneurs can get facilitation and incubation services without coming physically. Digital technology has created an opportunity for entrepreneurs and aspiring entrepreneurs to create a virtual incubator service model that connects them to the ecosystem. This new model can potentially disrupt the traditional incubator model (Morke & Swensson, 2020).

It is necessary to promote entrepreneurial culture and knowledge, especially in this time of distress, as it can lay a strong foundation for the future. Universities, science parks, and incubators all play a crucial role in providing a supportive infrastructure (Shwetzter et al., 2019). It is essential that incubation hubs, innovation centers. Work together with the entrepreneurial communities to create innovative solutions/products to suit the customers' needs. The hubs themselves have to be creative in reaching out to entrepreneurs. Hubs should run virtual programs for SMEs in various locations at the same time. Likewise, SNV Netherlands Development Organization, together with MDF West Africa, the Ghana Innovation Hub, i-Code Ghana, and Kumasi Hive, under the European Union-funded Boosting Green Employment and Enterprise Opportunities in Ghana (GrEEEn) project, is running an online incubation service to assess how entrepreneurs in Ghana can be supported during the pandemic. The online incubation program coached and mentored the participants to build eco-inclusive business models. Programs like these can provide social networking and engagement opportunities that are great for collaborations and developing innovative solutions and motivate entrepreneurs through the challenging journey of entrepreneurship (SNV, 2020). However, government financial support is needed to continue running more entrepreneurship support programs. Such platforms' role is critical for continued innovation, as innovation does not occur in a vacuum. It requires openness and interactions. The short-term measures of the governments have succeeded in relieving the pressure on entrepreneurs to some degree. During the pandemic, helping S&T firms was crucial to get the maximum possible result from the existing efforts. However, it remains to address the long-term objective of promoting sustainable growth and an equitable business environment by setting up S&T firms for a robust and enduring recovery in the long run.

## Financial Policy Recommendations for S&T Firm's Incubation Activities

**Recommendation for credit policy:** The biggest obstacle for S&T firms in accessing guaranteeing credit or preferential loan interest rates is that they have not met the strict capital and credit rating standards. In particular, S&T SMEs often cannot meet or can only meet very few conditions for unsecured credit loans. Therefore, it is necessary to have a specific mechanism for S&T firms to access incentives and encourage investors to invest in innovative S&T firms. We have some recommendations as follows:

Firstly, establishing the State investment fund for S&T firms under the public-private partnership model. This operation follows trust funds to call for investment capital from investors. Investment for S&T firms can be established through loans or equity to provide money in the post-incubation stage.

Secondly, it is recommended that the government should have built a particular financing program for S&T firms. Moreover, through a national financial fund, S&T firms can get unsecured or guaranteed loans for a specific time, usually at the beginning of post-incubation. However, due to the high-risk ratio of the innovative S&T firms, the capital of this program can be considered an expenditure of the Government if S&T firms unsuccessfully develop.

Thirdly, commercial banks must design individual credit product packages for S&T firms, which reduce the conditions for assessing financial capacity or credit rating of enterprises that can be evaluated based on criteria for identifying innovative startups or measures for evaluating the feasibility of business plans to control risks without collateral (Pham, 2018).

**Recommendations for tax policy:** Firstly, S&T firms at the beginning of the operation may not have revenue or benefit. Therefore, it is possible to apply with higher tax incentives than other company types, such as allowing tax exemption for the first five years and applying the 10% Corporate Income Tax (CIT) rate for a longer time than the 15 years, which is currently applied to other preferential enterprises. Simultaneously, it is recommended to transfer losses with no time limit instead of the current five years to ensure maximum support for S&T SMEs (Pham, 2018).

Secondly, policies should be designed for S&T firm's investors to maximize their support to raise capital for innovative S&T companies. For reaching this goal, it is necessary to issue official regulations on venture investment and regulations on investment for innovative startup SMEs such as Decree No. 38/2018/ND-CP of the Government. In particular, it is necessary to clarify the tax obligations of these investors when making investments or transferring capital. Provisions should be made on reducing CIT (for investors who are enterprises) or Personal Income Tax (PIT) (for individuals investing) in case of income from investment or capital transfer. Besides, it is possible to offset the loss of investment projects for S&T firms to reduce risks for investors and encourage them to invest capital for innovative S&T firms (Diem, & Hoang, 2018).

Thirdly, universities, research institutes, and TBIs supporting entrepreneurship, it is crucial to issue regulations on financial policies with specific characteristics for these objects. It can be applied to the results obtained from the pilot TBI in Can Tho to all incubators nationwide. Specifically, as follows:

Exemption from import tax on goods being technological products that cannot be produced or domestically imported by S&T firms directly serve the technology incubation activities at TBIs.



Preferential tax is applied at a rate of 10% for fifteen years, tax exemption for four years, and reduction of 50% CIT for enterprises implementing new investment incubating high technology projects in the next nine years at TBIs.

Apply regulations on PIT reduction for experts working in TBIs and individuals working in economic zones at present. There should also be specific regulations for other entrepreneurship support organizations, such as tax exemption for income from startup support for universities, research institutes, business support objects, infrastructure construction objects.

Fourthly, it is essential to allow innovative S&T firms to apply tax administrative procedures and simple accounting regimes according to the law on tax and accounting. Tax registration is done via the internet, and S&T firms in the first five years can declare VAT every six months or once a year if there is no revenue.

Finally, replace the tax exemption and reduction method with a specific time in the form of an investment tax deduction for S&T firms and investment objects. Investment tax deduction means allowing a decrease of a certain percentage of the total value of new assets invested in S&T directly into the payable CIT amount in the tax year. This method of incentive is as effective as the State now supporting capital for enterprises. Corresponding to the ability to create wealth and generate income based on profitable business and fulfilment of tax obligations. For S&T firms, after the initial period of tax exemption, in the following years, if they have income, this method can be applied. Similarly, investors and supporters of incubated S&T firms can also use this method.

## CONCLUSION

TBIs are considered appropriate for technology transfer and commercialization of research results from the research sector to the market. Furthermore, it promotes the incubation and formation of S&T firms. It also is a support policy tool for the development and establishment of SMEs

From the current situation of incubation services and policies to support incubation activities of S&T firms in Vietnam, it can be seen that TBIs and S&T firms also have certain favourable conditions to get closer to the valuable and specific support. However, the requirements of facilities, business capacity, financial policies, and Vietnam's legal framework still have many limitations. The authors have made specific proposals and solutions to enhance incubation services availability at TBIs for S&T firms. We also have recommended some keys to the government's support policies for this target group.

The link between research and production requires an adequate focus on investing in the incubation stage to help new technology businesses grow commercially. This beneficial concentration can also help investors accept significant risks of failure to invest in young S&T firms with good ideas and creative capacity. Technology enterprises will create breakthrough efficiency for both S&T and the economy-the society of Vietnam in the context of international integration.

## REFERENCES

- Al-Mubarak, H.M., & Busler, M. (2013). The effect of business incubation in developing countries. *European Journal of Business and Innovation Research*, 1(1), 19-25.
- Autio, E. (2017). Growth of Technology-based New Firms. *The Blackwell handbook of entrepreneurship*, 329-347.
- Bank of England. (1996) Financing for new technology enterprises.

- Candi, M., & Saemundsson, R.J. (2011). Exploring the relationship between aesthetic design as an element of new service development and performance. *Journal of Product Innovation Management*, 28(4), 536-557.
- Dao, T.T., & Pham, D.D. (2017); *Some Theoretical Issues in the Study of Promoting the Formation of Technology Enterprises through Technology Business Incubator*; *VNU Journal of Science: Policy and Management Studies*, 33(4).
- Dao, T.T. (2016). Vietnam's Science, Technology, and Innovation (STI) Policy in the Trend of International Integration: Current Situation and Solutions, *World Publishers*.
- Dao, T.T., Nguyen, T.N.A., Nguyen, A.D., Nguyen, T.T.H., Nguyen, D.H., Nguyen, T.T., & Pham, Q.T. (2018). "Road for incubating Vietnamese technology enterprises for the period 2015-2025", *World Publishing House*, 2018.
- Dao, T.T., Pham, D.D., Nguyen, T.N.A., & Nguyen, T.H. (2017); *Technology Business Incubation in Vietnam: An Approach to Legal Analysis*; *VNU Journal of Science: Policy and Management Studies*, 33(1).
- Davies, M. (2009). Mixed-use incubator handbook: A start-up guide for incubator developers. *Information for Development Program: Washington, DC, USA, August*.
- Diem, T.T.H., & Hoang, P.A. (2018). Some proposals for credit policy to create favorable conditions for start-ups to innovate and operate, *Financial Publishing House, Hanoi*;
- Fontes, M., & Coombs, R. (2001). Contribution of new technology-based firms to the strengthening of technological capabilities in intermediate economies. *Research policy*, 30(1), 79-97.
- Maine, E.M., Shapiro, D. M., & Vining, A.R. (2010). The role of clustering in the growth of new technology-based firms. *Small Business Economics*, 34(2), 127-146.
- Morke, O., & Swensson, K. P. M. (2020). Exploration of virtual incubators and development of incubator services for digital entrepreneurship: Receiving Entrepreneurial support from anywhere in the world?.
- Oakey, R. (1991). High technology small firms: their potential for rapid industrial growth. *International Small Business Journal*, 9(4), 30-42.
- Pham, T.D. (2018). Principles of developing specific financial policies for innovative start-ups-a view from international experience, *Finance Publishing House, Hanoi*.
- Rickne, A., & Jacobsson, S. (1999). New technology-based firms in Sweden-a study of their direct impact on industrial renewal. *Economics of innovation and new technology*, 8(3), 197-223.
- Shwitzer, C., Maritz, A., & Nguyen, Q. (2019). Entrepreneurial ecosystems: A holistic and dynamic approach. *Journal of Industry-University Collaboration*, 1(2), 79-95.
- Smith, T.F. (2001). Technology business incubation, a role for universities. *ATSE Focus*, (115), 6-10.
- SNV. (2020). Providing business incubation services during the COVID-19 pandemic.
- Thanh, T. (2017). Business Incubator Cultivating Start-up Dreams, *Vietnam Economic Newspaper*, June 12, 2017.
- Trinh, D.T. (2017), International experience in building a startup ecosystem, *Financial Newspaper* dated September 28, 2017.
- UKBI (2003), *Benchmarking framework for business incubation: final report*, January 2003, UK Business Incubation, 2.
- UNESCO (2006). *Technology business incubation: A toolkit on innovation in engineering, Science and technology*.
- UNESCO, 2000. *Manual on Technology Business Incubators*, 30- 31.
- UNIDO (1999). Component 3, *Technology Business Incubators and Technology Parks, In-depth evaluation of selected UNIDO activities on development and transfer of technology*. 3.
- World Bank (2010). *Global good practice in Incubation Policy Development and Implementation*, Washington DC.

**Received:** 20-Apr-2022, Manuscript No. AJEE-22-11817; **Editor assigned:** 25-Apr -2022, PreQC No. AJEE-22-11817(PQ); **Reviewed:** 09-May-2022, QC No. AJEE-22-11817; **Revised:** 13-Jun-2022, Manuscript No. AJEE-22-11817(R); **Published:** 20-Jun-2022