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Enterprise development policies and capacity-building in science, technology and innovation

## Key elements of entrepreneurship policy

Note by the UNCTAD secretariat

### *Executive summary*

This note addresses different strategies for promoting entrepreneurship for economic development, wealth creation and poverty reduction. It highlights some of the key elements of an entrepreneurship policy and the different ways of promoting firm formation and survival. The notes uses a number of examples and best practices from developed and developing countries to highlight the need for implementing policies and mechanisms to enable the emergence of entrepreneurial and transparent institutions that could raise entrepreneurship awareness, simplify regulatory procedures and set strategies to generate and convert ideas into firms that thrive and grow. It argues that entrepreneurship training and support infrastructure – such as (a) clusters, industrial parks and one-stop shops; (b) good academia–industry–government relations; and (c) special funds for enterprise formation and development – are among some of the possible measures developing countries could undertake to promote entrepreneurship. It also demonstrates that a successful innovation policy is expected to offer incentives that encourage firm formation and introduction of new products and services in the marketplace.

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## Introduction

1. Entrepreneurial activity plays a critical role in the production and delivery of services to communities; it creates jobs and enhances productivity and economic growth. Yet only a small fraction of all individuals who wish to become entrepreneurs or self-employed start their own businesses. More importantly, only a few of these new entrepreneurial firms are able to grow (Global Entrepreneurship Monitor (GEM), 2005). Narrowing the gap between the proportion of those who want to become entrepreneurs and those who actually attempt to start firms and encourage firms to grow may require putting in place specific policy measures that facilitate firm formation and growth.

2. This note attempts to provide an overview of strategies for promoting entrepreneurship, with a focus on early stage firm formation and growth. The first chapter addresses some of the key concepts and elements of an entrepreneurship policy likely to improve the rate at which new firms are formed, survive and grow. The second chapter looks at how entrepreneurship training and support infrastructure, good academia–industry–government relations, and special financing mechanisms could be used to encourage enterprise formation and growth. Finally, the note addresses alternative ways of assessing and measuring the impact of entrepreneurship policies on entrepreneurial activity in countries using existing entrepreneurship indicators.

3. The last four decades have witnessed unprecedented growth of new firms that generated significant wealth and job opportunities, spurred global economic growth and revolutionized various aspects of the society. The rapid diffusion of mobile phone communications in Africa, Asia and Latin America has had an impact on economic development and on the lives of millions of people who never before had access to a reliable telecommunications tool. This success has largely been driven by entrepreneurs who seized the technology advances and took the risk to invest their time and resources to develop products and services, in the process generating jobs and wealth, and connecting some of the poor to the global communication system in unprecedented ways.

4. One can argue that entrepreneurs within and outside research and development (R&D) investing firms and institutions increase the impact of such R&D outputs on economic development by identifying opportunities and turning knowledge into products and firms. It is the process of commercializing knowledge (e.g. licensing arrangements) or turning ideas into enterprises (e.g. start-ups) that may result in wealth and job creation or poverty reduction. Successful entrepreneurs can have far-reaching impacts on economic development by creating employment, widening the tax base, fostering innovation and building capacity in developing countries that in turn can help in reducing poverty. From this perspective, entrepreneurship is viewed as a driving force for economic development and poverty reduction.

5. This has led to the idea of an “entrepreneurial economy” – one whose political, social and economic responses are dictated by the dominance of not just knowledge but, more importantly, by “entrepreneurship capital, and the capacity to engage in or generate entrepreneurial activity” (Audretsch and Thurik, 2004). This is partly based on the observation that some small firms start as global players and the number of small firm owners has steadily been rising in developed and developing countries, and entrepreneurship is a major driver of innovation. Thus, some countries promote entrepreneurship as a way of maintaining or encouraging technological development and others as a way to overcome poverty and underdevelopment.

## **I. Key concepts and elements of an entrepreneurship policy**

### **A. Explanation of the key issues**

6. Although there is agreement on the importance of entrepreneurship as a driver for economic and social development, different researchers and institutions define entrepreneurship differently. This stems from the fact that entrepreneurship research spans several disciplines (e.g. economics, management, psychology and sociology). The main purpose of a definition is to provide the elements that separate an entrepreneur from other business management and economic activities and behaviours to enable policymakers to prioritize or best target entrepreneurship development.

#### **Who is an entrepreneur?**

7. The modern definitions of an entrepreneur borrow heavily from the work of Schumpeter (1934). He defines an entrepreneur as an “innovator” who introduces changes in the marketplace by combining resources in new or extraordinary ways to:

- (a) Introduce a new or improved good;
- (b) Introduce a new method of production;
- (c) Open a new market;
- (d) Introduce a new source of supply of material or part thereof; and
- (e) Generate new or improved business management processes.

8. Given the greater emphasis on innovation, Schumpeter’s “entrepreneur” is disruptive and discontinuous. One is an entrepreneur, according to his definition, only when he or she is innovative, and stops being one thereafter; the rise of new enterprises introduces new competitive pressures in the marketplace that force the demise of some old ones and old way of doing things, and give rise to new lead firms in the industry (the concept of “creative destruction”).

9. Stevenson and Gumpert (1985) reinforce this view by arguing that entrepreneurship is not an “all-or-none trait that some people or organizations possess and others don’t”, but should be seen as a range of behaviours. At one extreme is the “promoter type”, who is confident about one’s ability to pursue opportunities, adjust and capitalize on changes and surprises in the marketplace to realize one’s ambitions. At the other extreme is the “trustee type”, who is threatened by unpredictability and relies on effective management of current resources. Individuals and managers who move closer to the promoter type may safely be called entrepreneurs and those who have a tendency toward the trustee type may be considered administrators (see table 1).

**Table 1. A process definition of entrepreneurship**

<b>Entrepreneurs</b>	<b>Key business dimensions</b>	<b>Administrator</b>
Driven by perception of opportunity	<b>Strategic orientation</b>	Driven by resources currently controlled
Quick commitment	<b>Commitment to opportunity</b>	Evolutionary with long duration
Multistage with minimal exposure at each stage	<b>Commitment process</b>	Single-stage with complete commitment upon decision
Episodic use of rent of required resources	<b>Control of resources</b>	Ownership or employment of required resources
Flat with multiple informal networks	<b>Management structure</b>	Formalized hierarchy
Value-based and team-based	<b>Reward system</b>	Resource-based individual and promotion oriented

*Source:* Stevenson (2000).

10. Some studies on entrepreneurship have focused on the behaviour of an entrepreneur. Work by David McClelland at Harvard University inspired the Empretec methodology used by UNCTAD. This research identified 10 personal entrepreneurial competencies for detecting and strengthening entrepreneurial potential grouped in three clusters – achievement, planning and power. These competencies were (a) opportunity-seeking and initiative; (b) risk-taking; (c) demand for efficiency and quality; (d) persistence; (e) commitment; (f) information-seeking; (g) goal-setting; (h) systematic planning and monitoring; (i) persuasion and networking; and (j) independence and self-confidence.

11. More recently, the Organization for Economic Cooperation and Development (OECD) has defined entrepreneurs as “those persons (business owners) who seek to generate value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets”. This definition emphasizes the ability of the person to identify and pursue the opportunities (e.g. new products and new markets).

12. Stevenson and his team at Harvard Business School define entrepreneurship simply as “the pursuit of opportunity beyond the resources you currently control” (Stevenson, 1990). In this case, the entrepreneurs have to identify opportunities and must seek the resources necessary to realize them. It also acknowledges that the environment (from which the entrepreneur draws resources) plays a major role on his or her ability to pursue and realize the opportunities.

13. Although the differences in the definitions seem academic, they do reflect how entrepreneurial activity is measured and, in turn, affect policymaking. For instance, the World Bank Entrepreneurship Survey defines entrepreneurship as the “activities of an individual or a group aimed at initiating economic activities in the formal sector under a legal form of business”. As a result, the survey collects information on “firm registration” (i.e. formal) and focuses on policies that affect firm registration (i.e. procedures and administration such as electronic registers).

14. In sum, a clear definition is helpful in designing measures to promote entrepreneurship and measuring their impact. Although there are different definitions, most focus on the ability of individuals to form and grow firms. Therefore, this note will focus on the policies and strategies that inspire individuals to start and grow firms.

**Box 1. Profile of successful entrepreneurs**

One of the successful black entrepreneurs in South Africa, Richard Maponya, faced many hurdles at the start of his career. Now in his eighties, Mr. Maponya opened in 2007 a huge shopping centre in Soweto, near Johannesburg. He is quoted saying, "I wanted to start a clothing business in Soweto, but I couldn't get a licence. I did not get a licence to sell clothes which were considered luxury items and thus only saleable by whites, but I got a licence only to run a grocery store. When I wanted to open a shopping mall in the township 20 years ago, I was reminded by the powers-that-were at the time that I was a temporary sojourner in the city of Johannesburg. I was also reminded that I belonged somewhere in a corner of South Africa, but I never tired to keep on knocking on doors to get permission to build my dream."

Similar stories have been told by many entrepreneurs who have benefited from UNCTAD's Empretec centres. For instance, a fire destroyed Paola Tucunduva's laundry in Brazil. She rebuilt the facility and now employs 235 workers. Emelda Nyamupingidza, a producer of candles and polish in Harare, faces difficulties in getting foreign currency given Zimbabwe's current economic realities. She says, "Venturing outside my local market boundaries enabled me to earn the foreign currency I need to import raw materials. I view the current hardships in Zimbabwe as a challenge rather than a deterrent".

*Source:* Richard Maponya (2008). Taking stock. *The Property Magazine*. October 2007; UNCTAD (2008). Small businesses as a way out of poverty.

**B. Determinants of entrepreneurship**

15. One of the policy challenges in promoting entrepreneurship lies in the ability to put in place measures that create an environment within which entrepreneurship prospers or thrives. Some suggest that most people will pursue an entrepreneurial opportunity if it passes at least two basic tests: (a) it promises to improve or change the future status of the individual; and (b) the individual believes that he or she has the capacity to make it happen (Stevenson and Gumpert, 1985). In order to encourage entrepreneurial activities, therefore, policymakers could remove barriers, either to make it easier for the individual to realize the entrepreneurial opportunity that she or he wishes to pursue, and/or to enhance the rewards of pursuing an entrepreneurial opportunity.

16. This is reinforced by the observation that entrepreneurship flourishes in communities where resources are mobile, successful members of the community reinvest excess capital in the projects of other community members, success of others is celebrated and change is seen as a good thing (Stevenson, 2000). From this perspective, one can argue that an entrepreneurship policy should be centred on the individual: providing support to help him or her go through all the stages of firm formation and growth.

17. OECD proposes five main areas of determinants of entrepreneurship:

- (a) Opportunities;
- (b) Skilled people;
- (c) Resources;

- (d) Regulatory framework; and
- (e) Culture.

18. According to the OECD framework,<sup>1</sup> opportunities are created by the market conditions. The market conditions are determined by public policies and intervention, competition, access to foreign markets and procurement regulations, among others. Skilled people in this context relate to the individual capabilities of the entrepreneur and access to entrepreneurial infrastructure. In other words, the entrepreneurial capabilities include the human and social capital of the entrepreneurs. Resources reflect access to capital, R&D and technology. Capital covers all phases of business life, from access to early seed funds to access to the stock markets. R&D in this case is a resource that can be created or purchased, whether directly or in an embodied or diffused form. The regulatory framework encompasses all taxes, regulations and other public rules and institutions affecting entrepreneurship. Finally, culture comprises each individual's assumptions, adaptations, perceptions and learning.

19. The United Nations Development Programme's (UNDP's) report "Unleashing Entrepreneurship: Making Business Work for the Poor" identified three pillars of entrepreneurship: (a) a level playing field with fair rules that are fairly enforced; (b) access to finance for emerging, small and large firms; and (c) access to skills and knowledge (UNDP, 2004).

20. Furthermore, a study of 10 countries identified six major areas for promoting entrepreneurship in both developed and developing countries (Stevenson and Lundström, 2001):

- (a) Entrepreneurship culture and attitudes towards entrepreneurs;
- (b) Integration of entrepreneurship education in the formal education system;
- (c) Reduction of barriers to entry;
- (d) Provision of seed financing and loans/equity for new businesses;
- (e) Start-up business supports, such as mentoring programmes, incubators and peer networks; and
- (f) Specific measures to meet under-represented target groups, such as youth, women, ethnic minorities, technology entrepreneurs, aboriginals, etc.

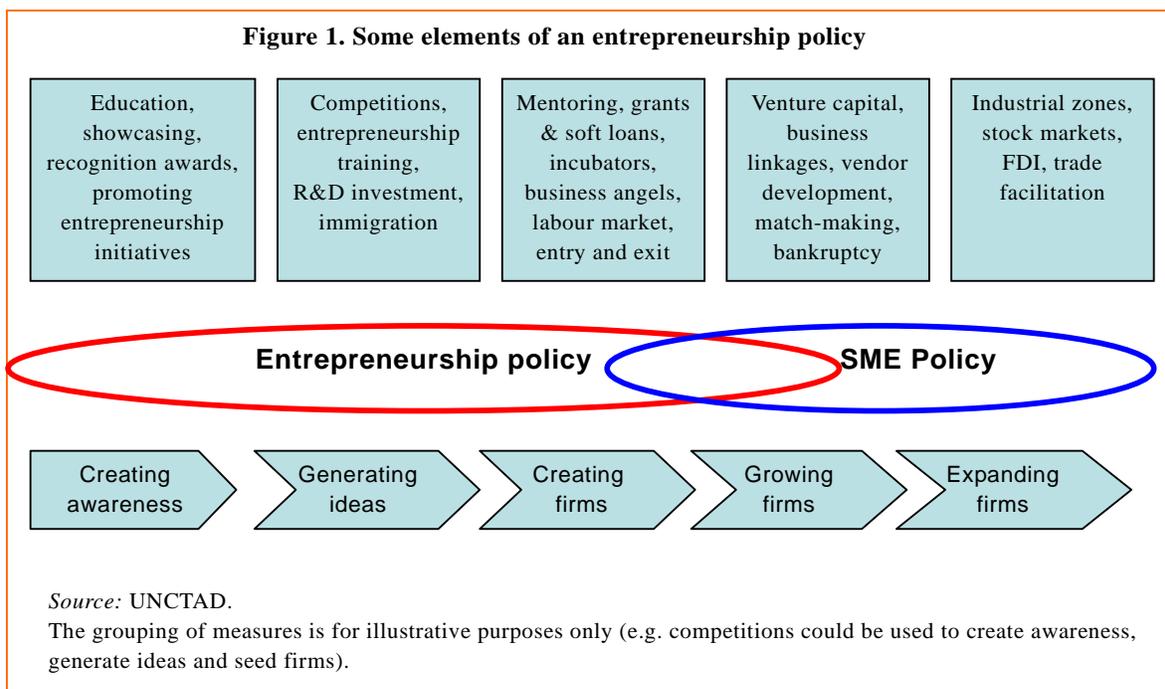
21. Overall, there seems to be some convergence on some key determinants for promoting entrepreneurship. These include (a) access to resources, in particular finance, skills and entrepreneurship training; (b) support infrastructure, both hard and soft; (c) culture; and (d) regulatory frameworks.

### **C. Key elements of an entrepreneurship policy**

22. Government entrepreneurship policy is likely to be influenced by social, political and economic interests. Public policies should create the conditions under which entrepreneurship can flourish. Therefore, an entrepreneurship policy framework may include measures for (a) raising awareness of entrepreneurship as a career option; (b) generating and highlighting potential entrepreneurial opportunities; (c) supporting individuals that assume the risk

<sup>1</sup> For instance, the Entrepreneurship Indicators Programme (EIP), undertaken by the OECD in partnership with Eurostat, identified 6 categories of entrepreneurial determinants. These include: regulatory framework (10 indicators), market conditions (6 indicators), access to finance (5 indicators), R&D and technology (6 indicators), entrepreneurial capability (4 indicators) and culture (4 indicators). For details, see the annex.

of starting a firm or commercializing knowledge; and (d) helping those struggling to grow their firms gain access to necessary resources (figure 1). Various measures could be implemented at each of these stages (from creating awareness to firm expansion), some of which are suggested in figure 1 (e.g. competitions, grants and loans) by different institutions (e.g. ministries of education, industry and finance).



23. Creating awareness is particularly important in improving entrepreneurial attitudes and seeding an entrepreneurial culture in a large proportion of the population. This can be achieved through education and showcasing the contribution of entrepreneurs and business solutions to development challenges. Several other measures – such as celebrating successful entrepreneurs through national recognition awards or featuring them as role models – can be useful in improving the image of entrepreneurship as a good career option.

24. Mechanisms to generate and harvest business ideas are needed to instill self-confidence and help identify entrepreneurial opportunities. All countries invest large amounts of resources in R&D that generates significant amounts of potential ideas that could form the basis of new or improved products and services. However, entrepreneurship training, technology transfer offices, business plan competitions and entrepreneurship challenge awards could all be used to generate business ideas and get the most out of R&D investments and skill development.

25. Institutional mechanisms and measures that enable potential entrepreneurs to turn the ideas generated into products and firms are needed. These could include licensing arrangements, financing support, business development services and supportive regulations to enable individuals to convert ideas into firms a bit more easily, noting that starting a business is a daunting task even under the best environments. The main goal at this stage is to encourage all potential entrepreneurs to attempt to become entrepreneurs by facilitating firm formation and technology or product commercialization.

26. Entrepreneurship policy has common ground with some aspects of innovation policy. Innovation policy largely focuses on enhancing the generation and diffusion of technology, and stimulating private and public investment in knowledge creation and commercialization. For example, incubators are promoted as a way of nurturing and commercializing technology (technology incubators) and start-ups (business incubators) and science and technology parks facilitate entrepreneurship development. As a result, a successful innovation policy is expected to offer incentives that encourage firm formation and introduction of new products and services in the marketplace.

27. Finally, measures to promote firm growth and expansion are needed to improve the growth expectation of entrepreneurs, increase job creation opportunities per firm and generate wealth (e.g. higher taxes, salaries and exports). Business networks and linkages help the new entrepreneur interact with established entrepreneurs, facilitating access to network resources to strengthen the firm and help its growth. Similarly, venture capital, cheaper loans, match-making and export facilitation and stock markets could help firms to grow and expand faster.

28. In practice, an institution can develop measures to create awareness, generate ideas and support firm formation as a single package. For example, Massachusetts Institute of Technology in 1990 developed the \$10K (\$10,000) Competition (now \$100K) for students interested in forming firms. It is thought to have spurred over 85 companies with a market capitalization of over \$10 billion. Similarly, a number of European countries run the Venture Cup as an innovation and entrepreneurship programme for university students. As of 2007, about 300 new companies are thought to have been generated by its participants in Sweden alone (<http://www.venturecup.se>). As will be shown in the next chapter, Governments could create awareness, generate ideas, and support formation and growth of firms, using existing institutions.

29. In sum, an entrepreneurship policy is supposed to create an environment and put in place support mechanisms that facilitate the emergence of entrepreneurs and start-ups, as well as the growth and expansion of new enterprises. In order to encourage entrepreneurship, policies should seek to encourage all the key institutions to become entrepreneurial in nature. This is not limited to R&D institutions, such as universities, but also to Government and private institutions. For instance, financial institutions could develop products to support start-ups, regulators could provide special support packages and incentives for emerging firms and industries, educators could embed entrepreneurship materials in their curricula, among others. This could lead to the emergence of what Audretsch and Thurik (2001) call an “entrepreneurial economy”, in which entrepreneurship permeates every aspect of the community.

## **II. Some strategies for promoting enterprise formation**

30. As noted above, some of the major areas of policy intervention include entrepreneurship training and skills, access to resources, culture and attitudes, supportive regulatory frameworks and creating entrepreneurial opportunities. There are a number of strategies that can be used to implement these measures. We have selected from among them three common approaches that can be used to implement an entrepreneurship policy both in developed and developing countries. These include entrepreneurship infrastructure, academia–industry–government collaboration and access to finance.

## **A. Entrepreneurial infrastructure**

31. The importance of good hard infrastructure (e.g. roads, energy, water, transport and communication) in promoting business development and growth in general is broadly recognized. While building hard infrastructure may entail major expenditures, building soft infrastructure (policies, procedures and institutions) is often more difficult. There are aspects of the soft infrastructure that could facilitate the birth and growth of firms and create the environment in which entrepreneurship is likely to grow. This chapter addresses elements of hard and soft infrastructure that could facilitate firm formation.

32. The formal and informal education policies can be adopted to create awareness, seed an entrepreneurial mindset and culture, and empower a large proportion of the population with the necessary entrepreneurial skills. Entrepreneurship material is already featuring in some primary, secondary and tertiary institutions of learning, and it is likely to become another area of study. Schools and universities around the world are teaching entrepreneurship. Thousands of people are already attending graduate business schools in developed and developing countries.

33. One example is Earth University, Costa Rica, that has developed a unique curriculum for teaching entrepreneurship termed the Entrepreneurial Projects Programme. This is a permanent course which is designed to (a) train students to become entrepreneurs with an understanding of the economic, social and environmental aspects of a firm; (b) promote the creation of economically profitable, ecologically viable and socially acceptable food production enterprises; and (c) develop value added businesses in the agricultural food system. The main goal of the programme is to develop in the students the entrepreneurial mentality and leadership and management skills needed to run an agricultural firm in developing countries. The students develop business ideas and must identify a staff member to act as a technical advisor during the three years of the programme (Larsen, 2003).

34. The student and her or his technical advisor work together as partners and go through the various stages of business development. However, decision-making processes must be made independently by the student. Key decisions include identification of the business ideas, undertaking feasibility studies, environmental assessment, seeking investment and launching the business. The university acts as a bank and provides \$3,000 as working capital and charges 22 per cent annual interest on the loan while the student provides the working hours. The student produces, markets and sells the product. He or she is required to provide monthly financial reports and meet all the administrative costs. The business is then finalized and liquidated, all the bills paid and the investment recovered with interest. The Earth University – the promoter of this initiative – is applying this model to meet some of the development challenges in other regions beyond Latin America.

35. In order to promote transparency and simplification of regulatory and administrative procedures, an increasing number of countries have developed entrepreneurial infrastructure that make it easy to start and grow a firm. For example, counseling, advisory and business planning services provided to new firm owners by public or private service providers play an important role in overcoming regulatory procedures. In some countries there are one-stop shops where entrepreneurs can complete business registration procedures and get information and advice online. There are an increasing number of Governments' websites and portals that provide information and services to new and existing entrepreneurs. All these measures encourage transparency and improve the regulatory environment.

36. Given the entrepreneur's preference for peer learning, many Governments have launched mentoring programmes to match experienced entrepreneurs with start-ups. A number of business development services are also provided by Governments. In promoting awareness, most Governments engage in the sponsorship of business awards while only a few engage in specific media awareness campaigns. A recent initiative, the Global Entrepreneurship Week (<http://www.unleashingideas.org/>), which will be celebrated globally in November 2008, seeks to create awareness about the importance of entrepreneurship. Teams in various countries are developing various activities to commemorate the Global Entrepreneurship Week. The project is being coordinated by teams in the United States and the United Kingdom, where similar initiatives have already been held in the past. More than 60 countries have already adhered to the initiative.

37. Governments could also work with the private sector in the design of skills development programmes that promote entrepreneurship in a sector of interest, especially in the design and development of industrial zones and clusters that promote entrepreneurship. For example, Malaysia's Information and Communication Technology Strategy was largely based on the provision of hard and soft infrastructure. The Government devised a plan to become a global information technology centre. They put in place support infrastructure in a 15 km by 50 km stretch between the international airport in Kuala Lumpur and the city centre to create the Multimedia Super Corridor (MSC). In addition to highways, buildings, energy and communication facilities, a package of incentives was offered to foreign and domestic firms and a number of innovative programmes were designed to increase awareness and emergence of new information technology products and firms.

38. To create awareness and stimulate innovation and entrepreneurship, the Government launched a number of programmes including electronic Government, multipurpose cards, smart school, tele-health, E-business, R&D clusters and "Technopreneur Development". Of these, the Technopreneur Development initiative, launched in 2001, was designed to (a) facilitate the emergence of entrepreneurs and/or start-ups and growth of existing information and communications technology (ICT) firms; (b) catalyse and nurture a cluster of ICT small and medium-sized enterprises (SMEs) and facilitate the growth of ICT SMEs into world-class companies. The programme offers financial support, incubation, match-making and marketing services, and encourages university researchers and students to become entrepreneurs ("unipreneurs"). By embedding this programme in the MSC, it enables emerging entrepreneurs to interact and network with leading global firms – raising the growth expectations and prospects for SMEs. One can look at MSC as an environment that promotes innovation and entrepreneurship.

39. The success of countries such as Malaysia has inspired many other developing countries to consider designing similar strategies to promote entrepreneurship. For example, Mauritius' ICT park, the Ebène CyberCity, is a 172-acre complex with ready-to-use, state-of-the-art office space, a commercial centre, 210 apartments and bungalows for its residents. The park is linked to prominent ICT and business schools, and has attracted about 60 ICT firms, including well-known foreign firms such as Orange, Infosys and Infinity BPO. A package of incentives similar to those that Malaysia has used is also on offer to investors in the Cybercity. Business and technology incubators and science and technology parks are a common feature of many entrepreneurship support programmes targeting high-growth sectors. It is estimated that about 89 locations around the world call themselves something with "Silicon" or "Valley" in the name to rival the original Silicon Valley in the United States (Miller, 2000). Almost all parks offer state-of-the-art office

space or land, and generous tax incentives to hi-tech investors. They generally bring together established innovating firms, R&D, financial institutions and start-ups within the same facility or location, thus creating a community designed to stimulate, support and encourage innovation and entrepreneurship.

40. Incubators, on the other hand, are designed to nurture and accelerate the growth of start-ups and may be conceived as technology incubators or business incubators. Technology incubators are often associated with public or private R&D units that wish to turn some of their outputs into technologies that could either be licensed or become a basis of a firm. Business incubators often admit clients that already have a business concept or idea, and may be stand-alone or sponsored by private or public institutions.

41. In general, incubators are expected to provide administrative support, business services (e.g. accounting and marketing) and advice, as well as cheaper operating space and, in some cases, financial support. Most incubators are linked to or sponsored by Governments, institutions (e.g. university/donors) and industry associations or a combination of any of the above. For example, infoDev, a World Bank initiative, mobilized approximately \$20 million for its ICT-based Business Incubator Initiative. It has so far supported over 70 business incubators in over 50 developing countries (see box 2).

42. There are also a growing number of private stand-alone incubators as well as virtual incubators that offer business and technology assistance to clients in different locations via the internet. The development of incubators is growing rapidly in Africa, Asia and Latin America. There are about 237 incubators in Brazil alone (Etzkowitz et al., 2005).

### **Box 2. Incubating the Banana Silk Yarn Separator – India**

Murugan, a young mechanical engineer, has always dreamt of becoming an entrepreneur. He observed that banana fibres had a shiny texture and wondered if this could replace the rich silk fabric his mother often used. After several trials and errors, he developed, with his resourceful engineering skills, a crude machine for extracting the banana fibre for use as a silk yarn replacement. After winning a business innovation award in Madras, he learnt about the innovation fund support of the TREC-STEP incubation system, an InfoDev-supported incubator. It offered financial support, counseling and product development facilities for manufacturing the machine to enable Murugan to further develop the Banana Silk Yarn Separator. It also identified a mentor to provide technology assistance.

*Source:* Tiruchirapalli Regional Engineering College-Science and Technology Entrepreneurs Park “Incubating Inclusive Growth”, <http://www.idisc.net/en/Article.38614.html>.

43. Clustering and networking arrangements also play an important role in firm birth and survivals, for example in the tourism industry (Keller 2000; WTO, 2001). Tourism organizations and SMEs play a role in the creation and management of local suppliers, clients and the customers’ experience of the destination. Partnering arrangements and mindsets encourage and induce entrepreneurship by pooling resources through strategic cooperative schemes and creating entrepreneurial opportunities through campaigns around new products and niche markets where start-ups could be created and nurtured. One can think of tourism as an integrated system in a limited geographical area – a form of cluster of large, small and emerging firms that support the

entire industry in various areas (e.g. training, entertainment, financing, transportation, culture and lodging firms, among others).

44. In sum, policymakers can create awareness, generate interest and entrepreneurial ideas, seed and grow firms by providing entrepreneurial infrastructure. The inclusion of incentives to stimulate private sector participation, encourage skills development and reduce the cost of starting and growing businesses in such infrastructure initiatives seems to be effective in promoting entrepreneurship.

## **B. Promoting entrepreneurship through academia–industry–government partnerships**

45. One way of promoting the birth and growth of firms, especially high-technology firms, is to improve the relationships between knowledge and skill producers (academia), knowledge users and product/service providers (industry) and regulators/policymakers (Government), commonly referred to as the academia–industry–government “triple helix” (Leydesdorff and Etzkowitz, 2001a). In sum, they represent the key players of any national or regional innovation system. The triple helix model does not impose boundary restrictions in relations, interactions and location of innovations and entrepreneurship, or the roles of the players. The triple helix is a “spiral model that captures multiple reciprocal relationships at different points of knowledge capitalization” (Leydesdorff and Etzkowitz, 2001b). In other words, industry can serve as a training ground and source of knowledge, universities could form and run firms, and Government could finance firm formation. The artificial boundary restrictions have to be removed for such a relationship to emerge.

46. In order for academia to play this role, the universities have to expand their roles from being producers of skilled elites to owners of the knowledge and founders of firms. This gives rise to what has been termed the “entrepreneurial university” (Clark, 1998), whose key characteristics include:

- (a) Independent, strong and efficient managerial systems;
- (b) Interdepartmental cooperation and increased collaboration with the outside;
- (c) Broadened resource base;
- (d) Transformation of faculty to accept entrepreneurial attitudes; and
- (e) Shared entrepreneurial culture throughout the university.

47. These characteristics are seen as key in enabling universities to function as centres for enterprise formation, facilitators of knowledge diffusion and transfer centres for firms and agents for development (creating jobs and wealth). The university in this case provides sufficient “space” to enable research teams to operate as “quasi-firms”,<sup>2</sup> encourages enterprising individuals to work closely with their clients (industry and Government), and supports or rewards entrepreneurship.

48. In practice, common goals and projects serve as major vehicles for promoting such partnerships. For example, it has been observed for a long time that academia–industry–government partnerships in Canada, the Republic of Korea and United States are well established. In 2006 alone, the United

<sup>2</sup> Many research teams already exist as “semi-private enterprises” that identify opportunities and seek the resources needed to realize them. Often, they have a credible research management team, invest in emerging fields of interest and compete for contracts and grants from private and public institution – just like private consultancy firms (see Etzkowitz, 2003).

States Federal Government R&D support to industry and universities was about \$20.9 billion and \$30.1 billion, respectively. At the same time, industry-supported R&D expenditure in United States universities stood at \$2.4 billion. It indirectly shows the presence of university–industry–government relations in R&D projects.<sup>3</sup>

49. A similar relationship is also observed in the Republic of Korea. For instance, during the development of its biotechnology strategy, the Government of the Republic of Korea worked closely with its industries and universities. The Government is estimated to have invested \$500 million, while the private sector invested an additional \$1 billion between 1994 and 1997. The Government set aside about \$380 million to help establish 600 biotechnology-related ventures. The plan was to invest about \$15 billion in the biotechnology-related sectors by 2007 in all the main areas: human resources, research facilities, financing, marketing and management capabilities (UNCTAD, 2004). It involves the public and private sectors as well as international alliances to stay abreast of new developments.

50. Although these relations are not well characterized in developing countries, there is a growing volume of evidence that suggests they play an important role. Several countries have already considered ways of encouraging such partnerships. For instance, South Africa's Innovation Hub (The Hub) is strategically located between two of the country's premier scientific and industrial research institutions: the University of Pretoria and the Council for Scientific and Industrial Research. Its location promotes the flow of knowledge between The Hub's tenant (industry) and the centres of knowledge generation (academia).

51. Similarly, Egypt's Mubarak City for Scientific Research and Technology Applications (MuCSAT), which focuses on industrial development and innovation, is located in an industrial area housing about 40 per cent of Egyptian industry. Established in 1993, MuCSAT comprises 12 research centres and occupies 250 acres. Its location is deliberately designed to encourage collaboration with industry.

52. In some least developed countries, such as Rwanda and Ethiopia, universities have a critical mass of skilled and highly qualified individuals. Universities in developing countries may have to work closely with Governments and donors to turn the idea of technology into a firm or at least develop it to a level where it is mature enough to be applied directly by its industries, given the levels of industrial sophistication. The model could also be applied in low-technology fields. For example, Zambia's second-largest producer and exporter of flowers and horticultural products (York Farms Limited) and Zambia's main Internet Service Provider (Zamnet Communications Limited) were all developed by the University of Zambia in partnership with industry and Government or donors (Konde, 2004). Similarly, Agro-Genetics Technology Limited (Uganda) and a number of cooperative nurseries in Kenya that supply cleaning plant materials to banana farmers are based on tissue culture technology developed by Jomo Kenyatta University of Agricultural Technology in Kenya in partnership with public stakeholders.

53. These trends have influenced policymakers to adopt measures that facilitate partnerships and commercialization of knowledge. For example, in the United States, the Bayh–Dole Act of 1980 encouraged universities and public R&D institutions to commercialize research outputs they develop using public funds. An increasing number of developed and developing countries

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<sup>3</sup> For details and breakdown, see the National Science Foundation Science and Engineering Indicators 2007.

have adopted similar strategies to encourage collaborations between academia and industry, and promote firm formation.

54. Overall, academia–industry–government relations are playing an increasingly important role in promoting firm formation and technology transfer and diffusion. However, policymakers need to stimulate such relations, ensuring their contribution toward economic and social development.

### **C. Improving access to finance for firm formation**

55. The role of finance in promoting entrepreneurship is well established and is a major part of a country's business environment. A number of countries have developed innovative financing mechanisms designed to stimulate emergence of industries or sectors, or firm formation in general. Some of these are complete financing packages that support firm formation by demonstrating an entrepreneurial opportunity or start-up.

56. For example, Fundación Chile – a \$50 million not-for-profit-foundation created in 1976 by the Chilean Government and the United States firm ITT Corporation to develop ways of diversifying the Chilean economy by creating industrial clusters – is one such unique financing mechanism. It does not necessarily fund potential entrepreneurs but rather uses its finance to demonstrate entrepreneurial opportunities. In brief, Fundación Chile creates firms to validate new technologies, and assess technical and economic viability, to attract individuals to form firms in the sector of interest. Once private investment has increased and the industry starts to emerge, the firm that the foundation developed is sold to the private sector. In the process, the foundation recoups its investment and moves on to the next stage of industrial development or another sector of its choosing. Since its inception, Fundación Chile has established more than 40 enterprises, of which about 30 have been sold to the private sector (UNCTAD, 2006).

57. The foundation is credited with the development of the wine, forestry and salmon industry clusters in Chile. In the case of the salmon industry, it first established Salmenes Antártica as a limited company in 1982 to demonstrate the technical and commercial feasibility of large-scale salmon farming, breeding and production. Once that was accomplished and a number of individuals developed fish farms, attracted by the healthy profits being made, the foundation established three other firms to demonstrate entrepreneurial opportunities in breeding, fishmeal production, and preparation and export of smoked salmon. By 2004, an entire cluster of salmon hatcheries, farms, processors, shippers, technical colleges and financing institutions, including foreign investment, had emerged and salmon exports had risen to \$1.4 billion (UNCTAD, 2006). In a way, it finances technology transfer by assisting emerging firms to adopt, use and manage the technology it has established, as well as the markets.

58. Different versions of financing mechanisms are being explored in developing countries. Countries such as South Africa and Malaysia have developed integrated programmes to empower formerly disadvantaged proportions of their populations or communities to become entrepreneurial through economic empowerment programmes. These programmes provide finance, business linkages, and government and municipal contracts. There is a growing realization that stand-alone finance packages may not be sufficient to enable individuals with limited business networks and management skills to grow their firms.

59. For instance, South Africa's Black National Empowerment Fund of about \$70 million is designed to promote the creation of new businesses and the

provision of expansion capital to early stage businesses. The fund offers debt, quasi-equity and equity finance of up to \$3 million to start-ups and firms wishing to expand their operations. It also provides financing of preferential procurement contracts, rural and community development projects, cooperatives and franchised operations. The benefiting start-ups and young firms must be at least 50.1 per cent black-owned and managed, have a sustainable business model, employ at least five people and be capable of paying back the fund in five to seven years.

60. Although the fund is uniquely tailored to address South Africa's historical inequalities, a modified version has recently been adopted in Zambia (i.e. Citizens Economic Empowerment Commission). A fund of \$34 million has already been established to facilitate enterprise development. Both the South African and the Zambian funds and their supporting mechanisms (e.g. skill development, enterprise development and facilitating business linkages and procurement measures) bear a strong resemblance to those used in Asia.

61. There are other ways in which policymakers can improve access to finance. They can facilitate the formation of venture capital firms that specifically fund start-ups and their growth in a given field, create special entrepreneurship funds and reduce the cost of lending to start-ups. A number of countries – including India, the Republic of Korea, Russia, the United Kingdom and South Africa – have set up government-supported venture capital funds that have attracted private sector participation. In addition, the number and size of venture capital funds in developing countries have been increasing rapidly. A majority of them are supported by major investment funds in developed countries. For instance, CDC Capital Partners has invested about £1.1 billion (roughly \$2.0 billion) with 42 fund managers in developing countries (i.e. CDC invests in funds that go to provide finance to projects). There are also emerging funds from Asia and North Africa (e.g. the Bahrain-based Venture Capital Bank's \$250 million for SMEs in the Middle East and North Africa).

62. Government could also encourage wealthy individuals (angel investors) to invest in early stage development of a firm by initiatives such as business angel networks, business angel co-investment schemes, tax credits and reduced taxes on proceeds from such investment. In brief, angel investors are often wealthy individuals who provide capital to a start-up in exchange for equity in specific fields or technologies of their interest. They fill the gap between support from family/friends (often less than \$10,000) and venture capital financing (above \$1 million–2 million). For example, while still operating from the residence of one of the founders and before it was even registered, Google received \$100,000 in start-up financing from Andy Bechtolsheim, an angel investor and one of the founders of Sun Microsystems. Similarly, another angel investor, Morten Lund, invested \$50,000 in Skype, the voice-over Internet protocol giant that was sold to eBay for \$2.6 billion at an early stage. In a way, angel investors assume greater risks than venture capital firms and both work closely with the start-up firms they support.

63. Angel investors play an important role in providing seed funds for firm formation. It is estimated that angels invested \$23.1 billion in 49,500 ventures (about \$470,000 per deal) while venture capital funds invested \$22.1 billion in 3,008 deals (about \$7.4 million per deal) in 2005 in the United States.<sup>4</sup> About 55 per cent of angel deals were in early and start-up stages, while about 6 per cent of the deals were by venture capital funds in these stages. Special legislation to encourage resources generated in the country to support firm

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<sup>4</sup> Federal tax credits for angel investors would encourage funding for entrepreneurs when they need it most ([http://www.unh.edu/news/cj\\_nr/2006/june/lw\\_060608credit.cfm?type=n](http://www.unh.edu/news/cj_nr/2006/june/lw_060608credit.cfm?type=n)).

formation could facilitate entrepreneurship, especially in developing countries that lack venture capital funds.

64. Governments could also use their financial regulatory mechanisms to compel financial institutions (e.g. banks, pension funds and insurance firms) to reserve a small proportion of their investment for start-ups. For instance, Governments could require commercial banks to reserve, say, 5 per cent of their loans for start-ups and, in return, Governments could reduce bank reserves deposited with the central bank by the same amount. Countries such as Malaysia have used a similar model to enable SMEs to access bank loans.

65. Government could also provide funds to financial institutions specifically to finance start-ups or commit a proportion of taxes to finance high-growth start-ups. For example, São Paulo State Research Support Foundation (FAPESP) is entitled by law to 1 percent of tax collected by the State of São Paulo, Brazil's richest state, and FAPESP is not allowed to spend more than 5 per cent of its budget on administrative duties. This cap makes available almost 95 per cent of the money collected to support scientific challenges of great economic or social importance. In 1998, it invested \$25 million in a genomics projects involving a network of 34 laboratories of different institutions that propelled Brazil to join other genomics powerhouses (largely developed countries). By 2000, the network had sequenced an entire genome, trained at least 200 young geneticists and spun off two companies.

66. Policymakers can use a number of instruments to create and stimulate the emergence of different financial tools that stimulate entrepreneurship. These could include tax incentives, legislation and financial regulations that could facilitate the development of venture capital investments by firms and wealthy individuals, special funds for development of clusters and to meet the needs of special groups, and provision of low-cost credit to start-ups by commercial banks.

### **III. Conclusions and issues for discussion by experts**

67. Institutions for developing and implementing entrepreneurship policies vary widely across countries. There are now a number of countries with a ministry of entrepreneurship, enterprise development or with a full-fledged department of enterprise development, such as in Canada, Croatia, Denmark, Malaysia, the Netherlands and the United Kingdom. In addition, some international organizations are working intensively in shaping effective entrepreneurship policies as well as developing internationally comparable indicators. Research and efforts to benchmark the experiences and performance of developing countries will stimulate the adoption of comprehensive entrepreneurship policies that will inspire and enable individuals to consider starting an enterprise, become formal and grow to create more employment, wealth (through taxes, exports and high-salaries) and innovation.

68. In the policy areas reviewed in this note, some best practices examples have been highlighted. For instance, entrepreneurial infrastructure should not only focus on improving the business environment conditions, but should also include measures for boosting entrepreneurial capacity such as awareness-building, education and skills development. The most successful programmes develop entrepreneurship curricula that reach students from elementary school to university. Innovative approaches to building entrepreneurship education and awareness have been developed in collaboration between Governments and the private sector.

69. In the implementation of university–industry–government projects, the existence of incubators and science parks can serve as linker units – a space within which the three parties can interact, seed and nurture start-ups, as well as finance and promote technology transfer. It is within these units that entrepreneurial activity is likely to be facilitated and implemented. This approach also works best if all the three parties have a stake and make a contribution in the projects proposed. This has to be seen as going beyond the traditional cooperation in R&D projects and commercializing projects.

70. Difficulties over access to finance are among the main barriers to entrepreneurship development. Special mechanisms for access to finance and other services provided by the banks and other finance providers should be supportive of start-up entrepreneurs. Preferential conditions offered to start-ups to access and service public contracts and incentives should facilitate linkages between start-ups and established businesses. Furthermore, Governments may have to expand the role of traditional financial institutions to enable start-ups to gain access to loans and encourage the formation of business angel networks.

71. It is expected that during the discussions, experts will share their views on existing practices in the area of entrepreneurship policies and will debate key success factors and risks to be considered by developing countries. The following issues have been identified for the experts to discuss:

- (a) What makes a good entrepreneur?
- (b) What are the policies and regulatory frameworks that have proven to be effective in stimulating the encouragement of entrepreneurs?
- (c) What are the main support institutions needed to enable enterprises to start up and grow (e.g. clusters and technology parks, access to finance and intellectual assets)?
- (d) What linkage arrangements can help promote entrepreneurship, innovation and competitiveness (e.g. public–private partnerships, academia–industry–government linkages, large–small enterprise linkages, subcontracting, foreign enterprises, supply networks)?
- (e) How can firms acquire and upgrade technologies and what are the appropriate policies needed to make firms innovative?

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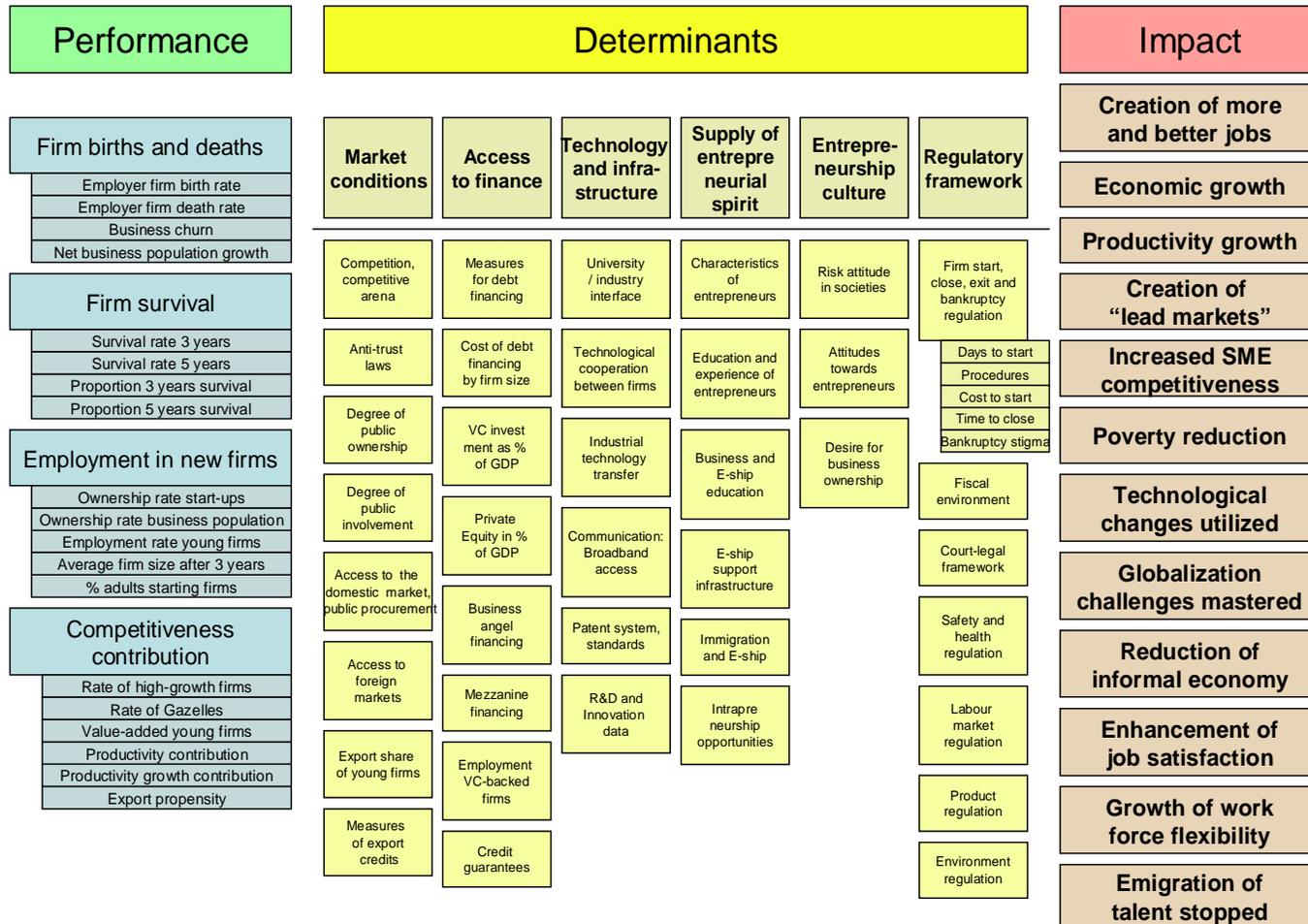
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## Annex. The OECD Entrepreneurship Indicators: determinants, performance and impact



Source: OECD (2007).