activities will be based on the principles of corporate governance, transparency and accountability to society, taking into account international best practices.

During the upcoming changes in the education system will be successful only those universities – the leaders of change, which adequately perceive the patterns of changes and tactically correct use of the opportunity.

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Innovation for Small Business in North Carolina: Lessons for Kazakhstan

Myrzaliev M.

An important part of any national socio-economic policy is an innovation policy, which determines the objectives of innovation policies and support mechanisms for priority innovation programs and projects. In Kazakhstan primary and urgent problems are more efficient use of scientific development and application of results of fundamental and applied research to production. Innovative activity is reduced under the influence of low effective demand for scientific and technical products, as part of the state and the nongovernmental sector of the economy. In terms of demand reduction, organizations in the first place reduce the production of high technology products, often replacing it with technically simpler and cheaper options. Formation and implementation of innovation policy is based on creating a system that will reduce the time and use high efficiency in the production of intellectual, scientific and technical potential of the country.

With the globalization of world markets, there is a constantly increasing role of scientific and technological progress (STP) to ensure the competitiveness of national economies. The strategic importance of STP has led to an accelerated development pace and need for increased support of innovative areas of activity. By innovation, we mean the process of formation and development of original ideas to create new products, services and technologies. The success of national innovation depends on the overall economic situation in the country and science and technology strategy. State support for new ventures may include full resource support, market research, provision of professional expertise and effective management.

The innovation process is carried out in the following stages:

1. Opportunity recognition – finding ideas for new products and services;
2. Opportunity evaluation and selection – a preliminary selection of the most promising ideas;
3. Venture creation – which includes searching for an investor, conducting research and developing new products or services, protecting copyrights, producing a product or service, checking their competitiveness, and promoting new products or services markets.

The focus of this paper is innovation policy of the United States, including North Carolina, that ensures the competitiveness of the economy through effective management of innovation in technological development, industries and regions, creating conditions for the development of high-tech SMEs and enhancing the scientific and engineering potential.

One of the most important focus areas for the U.S. federal government with improving the U.S. economy is to enhance innovation and small business creation in order to create scientific and technological basis for comprehensive development in the twenty-first century. In order to ensure favorable conditions for the success of innovative SMEs, in 1982 the Government of the United States adopted the federal law called "The Small Business Innovation Development Act". According to «The Development of Innovation in Small Business» Amendment of 1992 the main objectives are as follows [1]:

1. Stimulate technological innovation;
2. Use the potential of SMEs for the implementation of federal orders to perform research and development;
3. Assist in attracting talented people to engage in technological innovations;
4. Assist the private sector in commercializing scientific and technological achievements and the results of research performed under federal orders.

In order to meet national needs in special research and development, as well as to ensure a more successful operation of innovative enterprises engaged in scientific research and experimental development (hereinafter R & D), the United States implemented a set of different-scale scientific and technical programs. Among the most effective actions at the federal level include such programs as «a program of innovative research in the small business» (The Small Business Innovation Research – SBIR) and Technology Transfer Program Small Business» [2]. Both of these programs are coordinated by the Federal Department of Technology.

The purpose of the SBIR Program is to attract innovative small business ideas for solving technical problems on the subject of the 10 largest federal departments and national agencies [3]. The goal of the SBIR program is to stimulate technological innovations, strengthen the role of small business concerns in federal R&D, increase the commercial application of these research results, and encourage participation of socially and economically disadvantaged persons and woman-owned businesses. By law, each agency must set aside a small fixed percent of their budget each year to support these programs. Among them, the Department of Agriculture, Department of Trade, Department of Defense, Department of Education, Department of Energy, Department of Health and Human Services, Department of Transportation, Environmental Protection Agency, National Aeronautics and Space Sciences, National Science Foundation and the Atomic Energy Commission. Each of these organizations may subsidize more than $ 100 million to carry out research and development by small businesses. These organizations, as part of being members of SBIR, determine the size and types of financial support for future development and conduct thematic research plans, assess the prospects of the business proposals and conduct competitions on the distribution of subsidies, grants or contracts. SBIR is a competitive program financing innovative SMEs related to research and development on scientific and technological problems of national importance that have considerable commercial potential.

In addition, SBIR and STTR are a key means for developing university technology into the marketplace. They also provide critical funding to very early stage investments, even before "angel" investors or venture capital typically invest. The three phases of this process range from a Phase I proof-of-concept ($100,000), to a Phase II award ($1,000,000), then a Phase III where the product moves into the marketplace and is not federally funded any longer. STTR can be done primarily at a university, while SBIR requires most of the work be done in the small business.

One of the most critical tasks for the STTR to improve the technology program is to encourage small businesses to interact with non-profit research institutes [3]. This program enables SMEs to get

financial and technical assistance in the establishment of joint ventures and / or temporary associations focusing on development of new technologies from the initial idea to full implementation. The main customers of research on this program are the largest U.S. government agencies with a total annual budget of more than $1 billion. The Department Technology Agency (AMB) is coordinating the STTR program at all stages of its implementation. The STTR program is funded from the budget allocated for the implementation of R & D that is important for the further development of the country. These funds are intended for participants of innovation – small businesses and nonprofit research institutes that do not have sufficient funds to carry out costly and time-consuming research. Agency AMB plays the role of chief coordinator of the SBIR program and the STTR program providing guidance and supervision for all projects. In order to attract private capital for the commercialization of completed innovative projects, the Small Business Agency (SBA) has developed a computerized system to search for potential sources of capital involved in the implementation of SBIR and STTR competitive projects and programs.

Another effective mechanism for financing innovative SMEs, is the «Investment Company Small Business», which serves to provide SMEs and venture capital investment at the time they start, grow and expand [4]. This program is implemented and coordinated by the Small Business Agency. The SBA currently operates more than 400 investment companies – SBICs, which using its own capital and attracting borrowed funds, carry different types of investment to SMEs at affordable rates under warranty of Agency AMB. Virtually all SBICs are private commercial enterprises. They provide equity capital, long-term loans, bond issues, as well as services for financial management. The SBIC program is intended to cover all types of manufacturing and service enterprises.

Among the fairly active mechanisms that facilitate the development of new technologies, including innovative SMEs, are the following two programs:

1) «Business Information Centers» (Business Information Center – BIC) is aimed at supporting the activities of about 400 data centers, which promote the use of advanced high-tech methods of work in small businesses through the use of modern equipment, communications systems and software [5].

2) «The body of consultants who are former executives» (Service Corps of Retired Executives – SCORE) offers a system of free advice on technical, organizational and financial problems for beginners and existing entrepreneurs in different stages of their ventures [6]. With this program, practical advice and mentoring can be performed directly in enterprises. The program operates 11,500 volunteer counselors collaborating with all the centers of support for SMEs in different parts of the country. This program ensures the transfer of expertise highly skilled young generation of entrepreneurs, while contributing to the rapid development of new technologies in various sectors of business. The activities of consultants SCORE is partially funded from the budget of the agency AMB.

President Obama challenged the Nation to out-educate, out-innovate, and out-build competition to win the future.

A critical ingredient in this endeavor is the creative spirit of the American entrepreneur that featured prominently in the President's Strategy for American Innovation – a framework for long-term economic growth and sustainable job creation.

President Obama launched Startup America, a national (public/private) campaign to celebrate, inspire, and accelerate high-growth entrepreneurship across all corners of the country, and the formation of the Startup America Partnership to catalyze private support for entrepreneurial ecosystems [7].

North Carolina's transition from an agricultural and traditional manufacturing economy to knowledge and innovation economy continues to evolve at a rapid pace. For more than five decades, the state has responded to this transition by making strategic investments in infrastructure, institutions, and

human capital. Because of these investments, North Carolina has achieved a leading role in the "basic" and early-stage "applied" research that forms the foundation for breakthrough innovations. The vast majority of this foundational research has occurred in the state's world-class research universities and non-profit research institutions. North Carolina has some shining examples in which this research has created innovations that generate commercial successes and advance society. Examples include advanced global information and communication technologies, innovative treatments for some of the most challenging health ailments, and ground-breaking approaches to the most pressing issues.

These successes, however, are not enough to provide best-in-class, economic development built on a strong foundation of homegrown commercialization. Additionally, there is a growing need to attract and retain innovative entrepreneurs to produce viable products and services upon which to build the economy. Fortunately, North Carolina has the intellectual capital and facilities to foster research and innovation. However, the state needs to make some important changes to accelerate the progression and transformation of innovative ideas into economic development and prosperity. Specifically, the state needs to accomplish the following:

1. Define the Innovation Challenge: Innovation–the creation and adoption of new products, services, and business models–is a fundamental driver of economic, governmental, and social prosperity in the 21st century. In light of the increasing pace of innovation and growing global competition, North Carolina needs to adapt, as it has done in the past, its government structures and policies to harness the opportunities that innovation presents at the pace they are presented.

2. Assess North Carolina's Innovation Performance: As revealed by a comprehensive set of statistical indicators and geographic maps of North Carolina's innovation assets and activities, two significant patterns characterize the state:

• North Carolina ranks at or below the U.S. average on several indicators of its innovation-related assets and activities.

• North Carolina's innovation assets and activities are geographically concentrated in metropolitan areas that are distributed broadly across the state.

3. Recommend an Innovation Framework for North Carolina: To accelerate the progression of innovative ideas into economic development and prosperity throughout the state, North Carolina state government should establish a framework of strategic, ongoing, collaborative relationships with the private sector for the purpose of discovering both the underlying impediments to innovation and the opportunities to engage in strategic coordination to overcome those impediments.

The One North Carolina Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Phase I Matching Funds Program is in need of grass roots support. The purpose of the program is to provide additional financial resources to small technology companies by providing matching funds of up to $100,000 in conjunction with a SBIR/STTR Phase 1 grant award. Since a Phase 1 grant typically tops out at $75,000 – $100,000, this program can play a significant role in the success of a small business bootstrapping the development of a novel technology in North Carolina.

When created by the General Assembly in 2005, the program awarded qualified companies in direct matching funds against their Phase 1 grant amount of up to the $100,000 level. Last year, the program budget was cut to only allow a maximum award of $75,000. This year, the budget has been further cut to only allow a $50,000 match with the total budget being $700,000 – representing only 20% of the required funds to adequately run the program.

The North Carolina Small Business Innovation Program has positively impacted the economic growth of NC through small technology businesses by accomplishing the following objectives.

– Helping more than 125 NC companies bring to market biotechnology, nanotechnology, medical technologies, computer software, military/defense technologies, pharmaceuticals, textiles, and other high-tech applications.

– Helping companies draw down a 9-to-1 return on the state dollar through attracting over $30 million in external company investment and over $32 million in follow-on federal funds.

– Creating more than 100 new private sector jobs – more to come as more companies benefit.

Representative technology areas and small companies that have benefitted from the NC Small Business Program are as follows:

– Military/Defense/Aviation – Materials Innovation Technologies (Fletcher, NC);

– Nanotechnology/Green – Nanotech Labs (Yadkinville, NC);

– Biotechnology/Healthcare – Morphemic (Durham, NC);

– Education/Information Technology – The Sandbox Learning Company (Cornelius, NC).

The program leverages federal SBIR Phase 1 dollars to help NC Technology Companies be more competitive against SBIR applicants in other states for the larger SBIR Phase 2 dollars. An economic development goal of the $50,000 to $100,000 state matching awards is to attract the $750,000 or larger awards from the federal agencies to North Carolina.

An example of how SCORE has supported the sustained growth of a local, small business is a company called Progressive Computer Systems, Inc. which was founded by Mark Michal and Lisa Mitchell in 1987. This company provides full-service IT support for pharmaceutical, biotech, medical, and professional organizations in the Triangle and Triad area of North Carolina. SCORE has worked with Progressive to provide strategic business consulting, SWOT (Strength/Weakness/Opportunity/Threat) Analysis, strategic marketing assistance, customer service assurance, and employee job satisfaction for Progressive's employees. According to Progressive's owners, one of the biggest advantages of working with SCORE has been the strategic business planning which has given the two owners a united direction for long-term growth and a constant focus on repositioning the business as needed to remain in business for over 20 years in a fast-paced, ever-changing industry. Having access to a free group of seasoned professionals from SCORE has been instrumental to the growth and long-term success of Progressive Computer Systems, Inc. [8].

In Kazakhstan, the national innovation system began to take shape in 2003 in the form of institutional and physical infrastructure. Project financing was given on behalf of the JSC National Innovation Fund (hereafter referred to as JSC NIF), engineering and technology transfer on behalf of JSC's Center for Engineering and Technology Transfer (JSC ETTC), venture capital financing in the face of a number of venture capital funds with the participation of JSC NIF. Physical infrastructure took the form of four parks in the cities of Almaty, Karaganda, Uralsk, as well as ICU Tau.

With the support of the state Kazakhstan has enjoyed an active process of formation of the innovation system, the constituent elements of which are scientific potential, innovative entrepreneurship, and innovation infrastructure. The fundamental legal act in the field of innovation development is the law of the Republic of Kazakhstan dated 23 March 2006 «On state support of innovative activity», which has been amended by the Law of the Republic of Kazakhstan dated March 30, 2009 [9].

The law provides for standards that enhance the interests of the various legal entities, in particular, the development of institutions such as the JSC NIF, JSC ETTC, JSC «Science Foundation» and JSC «KazAgroInnovation» whose main activities are first of all aimed at the development of the innovation sphere in different directions.

This law establishes standards of state support in the form of innovation grants:

– the acquisition of innovative technologies;

– the implementation of development activities and (or) risk research of applied nature;

– to prepare a feasibility study of the innovation project; the patenting of intellectual property in foreign countries and (or) international patent organizations.

In order to develop an innovative economy in Kazakhstan, the national program for accelerated industrial and innovative development for 2010–2014 (hereafter GPFIIR), was approved by the Decree of the President of the Republic of Kazakhstan dated March 19, 2010 № 958 [10]. GPFIIR is the key

instrument in the economic sphere – the first industrial plan, a 10-year strategy for Kazakhstan. The program is aimed at ensuring sustainable and balanced economic growth through diversification and enhancing the country's competitiveness. Seven priority areas of the program are identified – the development of agriculture, metallurgy, oil refining, energy, chemistry and pharmaceuticals, construction, transport and communications. Proposed additional areas covered by this program are engineering, uranium and light industry, tourism and space. The Ministry of Industry and New Technologies within GPFIIR works on building an effective national system of scientific innovation and development of innovative infrastructure for 2010–2014.

Within GPFIIR the road map for business 2020 has been implemented for business development in the regions [11]. It is a part of the program to deal with the tasks performed in the following areas: support for new business initiatives, improvement of the business sector, support for export-oriented industries. This program provides: increasing the availability of financial resources for private sector enterprise in the implementation of new investment projects aimed at industrial and innovative development, attracting private sector funds, primarily banks for investment projects in the primary sectors of the economy, raising finance and economic sustainability of private sector enterprises, especially small and medium-sized businesses.

However, experience has shown that the establishment of the infrastructure has not led to an increase in innovative activity. This requires to develop and implement new approaches to the formation of the National Innovation System (NIS), efficiency of interaction of its elements (including completion of missing links in the «chain» of innovation support), as well as increased interaction and coordination of these elements to achieve the ultimate goal. In this connection, weaknesses may be noted in the existing system of national innovation in Kazakhstan:

1. Lack of consistency in the implementation of government policy in Science, Technology and Innovation;
2. Lack of coordinating the national, regional and sectoral levels of NIS (lack of formalized approaches to work at the regional level);
3. Low initial technological and management level of enterprises;
4. Deficit of highly skilled technical personnel;
5. Lack of awareness about the possibilities of increasing productivity through innovation (weak innovation culture);
6. A small domestic consumer market;
7. The existing gap between science and industry;
8. Long periods of obtaining protection for inventions and industrial designs;
9. Less than 1 % of Kazakhstan applications for inventions patented in other countries;
10. Lack of an effective mechanism of interaction with representatives of the business and scientific community;
11. Lack of qualified personnel in the field of technology transfer.

These market conditions in Kazakhstan are different from the United States because the business programs like the SBIR, SCORE, and STTR are more mature in the United States while similar business programs are fairly new in Kazakhstan. In addition, the Small Business Agency is in existence to oversee and foster small business innovation.

This paper looks at the United States' and North Carolina's successful transition from an economy focused on agriculture and industry to one of innovation and technology. In doing so, it seeks to draw on the experience of the state as a means of directing and informing policies for small and medium size enterprises in Kazakhstan. The findings suggest that numerous gaps exist between policy objectives of Kazakhstan's innovation policy program, and the actual capacity of local businesses to innovate. Much of this can be tied back to the education system, and the need to develop a more targeted approach to educating that looks at the future needs of the economy, both domestically

and internationally, as well as the population's ability to add value to the economy by drawing on the country's existing comparative advantages. Developing human capital and stronger institutions is perhaps the most important part of this process, that necessarily requires a long-term vision and approach oriented not only to the future needs of citizens, but also towards future trends in the global market place.

1) It should not be assumed that what has worked in North Carolina will work in Kazakhstan. While there are certainly lessons to be learned from the experiences of small businesses in North Carolina regarding innovation, these experiences must be tuned to the unique cultural, social, and institutional circumstances in Kazakhstan. The main factors hampering the development of NIS can be identified as the following:

a. The absence of a common development strategy of innovation;

b. Lack of coordination between institutions and innovative development of a single center of decision-making and responsibility;

c. Low innovation activity of enterprises and lack of demand for innovation;

d. Chaotic development of innovation infrastructure, without taking into account the needs of the real economy and developing specific strategies to be implemented;

e. Weak relationship between science and business;

f. High cost of start-up capital, constraining investment in innovation, as well as under-development of the venture capital market for financing innovative small companies.

The virtual absence of analysis of advanced technologies in the world and their use in the Republic of Kazakhstan:

1. Government needs to address policies that support development and innovation of small businesses through creating a favorable business environment.

2. Overall upgrading and improvement of infrastructure needed in roads as well as technologies.

3. Linkages between sectors needed especially with government, industry and R&D institutions.

As has been noted above, small businesses face numerous challenges to improving innovation, including a weak domestic market, lack of access to financing, and lack of links between different sectors of the economy. Just one policy cannot fix this, and as such a set of policies is needed to address a variety of different sectors of the economy and society over the long term that improve education, critical thinking skills, and leverage unexploited synergies between businesses and the government.

The focus paper is to study the current innovation system of the United States and more specifically that of the state of North Carolina. This system of innovation ensures the competitiveness of the economy through encouraging effective management. The successful management of innovation requires policy makers to take into consideration technological development and the unique competitive advantages of industries and regions. The overall goal is to create conditions for the development of high-tech SMEs and enhance businesses' scientific and engineering capacities. This topic is extremely important because Kazakhstan recently started similar business innovation programs. Kazakhstan can learn important lessons from the programs started in the United States and North Carolina.

Institutions that promote innovation among SMEs in the United States include the Small Business Agency. The Small Business Agency oversees programs promoting innovation among small businesses such as SBIR, SCORE, and STTR that assist small businesses with important strategic decisions that foster long-term growth strategies. In addition, there is little or no government interference or corruption to hinder the development of small business innovation. In North Carolina in particular, examples of small business innovation include advanced information and communication technologies, innovative treatments for challenging health ailments, and ground-breaking approaches to the global most pressing issues.

In addition, economic growth of NC was positively affected by small technology businesses, including 125 North Carolina companies in the areas of biotechnology, nanotechnology, medical technology, computer software, military/defense technology, pharmaceuticals, and textiles.

In Kazakhstan the National Innovation System began to take shape in 2003 in the form of developing institutional and physical infrastructure. Until then, Kazakhstan did not have successful results with small business innovation. In order to develop an innovative economy in Kazakhstan, the national program for accelerated industrial and innovative development for 2010–2014 was approved by the presidential decree dated March 19, 2010 N 958. Within this program, the "Roadmap for Business 2020" has been implemented for business development in the regions which provides much hope for the future of small business innovation in Kazakhstan.

In order to improve some of the market conditions in Kazakhstan, the Government should pay attention to policies that support the development of innovation for small businesses. It is necessary to amend the Laws of the Republic of Kazakhstan «On state support of innovation» and «Science», providing a single point of accountability for the development and implementation of a unified state policy on innovation and technological development.

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Abbreviations

1. AMB – Agency of medium business;
2. BIC – Business Information Centers;
3. NIF – National Innovation Fund;
4. NIS – National innovation system;
5. SBA – Small Business Agency;
6. SBIC – Small Business Investment Company;
7. SBIR – Small Business Innovation Research;
8. SCORE – Service Corps of Retired Executives;
9. SME – Small and medium enterprises;
10. STP – Scientific and technological progress;
11. STTR – Small Business Technology Transfer Program