The Role of financing Innovative Activities in Accelerating of Economic Development (in the case of Uzbekistan)

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Abstract — Nowadays, in the market economy, it is important to produce highly advanced science-intensive products, not only in domestic, but also in foreign markets. That is why we can see that demand for them is rising day by day. As you know, the scientific potential is primarily determined by the amount of investment in the development of fundamental research in science, as well as the number of patents and licenses, the share of world literature. In the name of the year 2018 - the Year of Support for Active Business, Innovation Ideas and Technology, the effectiveness of innovations has been increasing. In particular, the issues identified in the 3rd section of the Strategy for the further development and liberalization of the economy in the five priority areas of development of the Republic of Uzbekistan in 2017-2021 will also contribute to the further improvement of the innovative environment.

- **Index Terms**— Innovation, financing of innovation activities, internal and external sources of finance to fund their innovation activities, public investment resources, investments, countrywide funding sources, innovative goods.

1 Introduction

Finance plays a critical role in innovation as it allows organizations to conduct research, adopt technologies necessary for inventions as well as develop and commercialize innovations. Accessing external finance for innovation is an important challenge for firms. Firms can fund innovation activities using a variety of funding instruments provided by different types of financial intermediaries and investors. Access to external sources of finance is often particularly challenging at the seed and early stages of business development as at this stage companies face high barriers for accessing finance notably as they lack a record of accomplishment.

The role of finance for innovation

Both funding needs and funding availability are closely related to the stage of development of the firm and its innovation projects.

- In the initial phase when inventions are developed and research conducted, there is still much uncertainly about what innovations will emerge, if any. This makes it very difficult to obtain funding. These financial constraints are one of the reasons why policy typically plays an important role at funding the stages of technological development.
- At more advanced stages, with the development of prototypes and the commercialization of inventions, specialized inventors who are skilled in assessing new technologies and can handle risk, such as venture capitalists and business angels, become more willing to provide funding.
- In the final stages, at the level of technology diffusion and adoption, once both technological and market uncertainly have all but disappeared, more traditional suppliers can provide the required funding to scale up operations as well as to finance purchasers interested in adopting new innovations.

It is worth noting that even if the innovation process may involve the same stages in small start-up and a large multinational, the sources of finance that they have available vary significantly. Large firms can more easily finance their R&D activities, whether using internal resources, getting a loan from a bank (using their tangible assets as collateral if required), issuing bonds, or raising equity finance in the stock markets. Start-ups do not have as many assets to use as collateral and their innovation investment is less diversified, and may represent a much larger share of their activities for innovative firms. As a result, their funding options are much more limited, and often need to rely on friends and family before being able to access other sources of capital.

2 Theoretical Framework

2.1 Funding for innovation activities

Funding for innovation activities is one of the most pressing issues today, and can be effectively and efficiently implemented depending on the forms of organizing innovation activities and financing methods. This, in turn, is based on an advanced financing system. In the modern market economy, there is a clear example of independent enterprises, industrial companies, financial industry groups, small innovative business, investment and innovation funds, local governments and private individuals. All of them participate in the process of re-production and contribute directly to the development of innovative activities. It is important to pay attention to two key conditions for effective implementation of the principles of funding arrangements: the intensification of innovation, scientific, technical, and industrial policy of the state, and the willingness of entrepreneurs to move to active investment.

The type of ownership, the degree of centralization, the nature of ownership and the forms of financing, and the complex accumulation of resources characterize the innovation activity financing system.

2.2 Sources of finance to fund innovation

Firms can use either *internal or external sources of finance to fund their innovation activities.*

The main source of finance is retained earnings, the profits accumulated over time which have not been returned to shareholders. Firms typically prefer to use internal financing rather than external financing as the latter can be very costly. As a result, there are projects that firms would choose to undertake if they had sufficient internal resources available, but which will not be taken forward if firms need to access external finance to develop them. In many cases, firms do not have the option to access external financing.

In contrast, external sources of financing includes debt and equity (as well as some hybrid forms), which can be provided by individual investors (such as business angels), venture capital funds, banks and capital markets (among others). Conditional on having to resort to external funds, debt is generally preferred to equity, since if available debt is typically a cheaper source of finance (even if still more expensive than internal funds).

The sources of funding for innovation activities by types of ownership are divided into:

- Public investment resources (budgetary funds, off-budget funds, government borrowing, stocks of shares, state-owned property);

- Investments, including financial resources (including corporate investors, insurance companies, investment funds and companies, investment funds of non-government pension funds, own funds of enterprises, enterprises, private entrepreneurship entities, non-commercial organizations, commercial banks, other credit institutions, and government-owned investment banks' credit resources.)

Countrywide funding sources include:

- Own funds of budgets and extra-budgetary funds; - "attracted" means of the state credit and insurance systems;

- Borrowings of the state as external and domestic debt (government bonds and loans).

Enterprise-level financing sources:

- Own funds: profit, depreciation charges, insurance payments, nonmaterial assets, main and circulating assets;

- Funds attracted sales proceeds, and contributions, targeted earnings;

- Borrowings of various types of budget, banking and commercial loans.

3 The role of innovation in Uzbekistan

In our country, projects aimed at developing energy efficiency and resource saving technologies and improving the production of high-tech products are of particular importance. Within the framework of implementation of the priority directions of the economic program on acceleration and expansion of the scale of its modernization, technical and technological renewal, diversification of production and its leading branches, in the first half of the current year on the further increase of competitiveness and diversification of industrial sectors consistent measures have been taken.

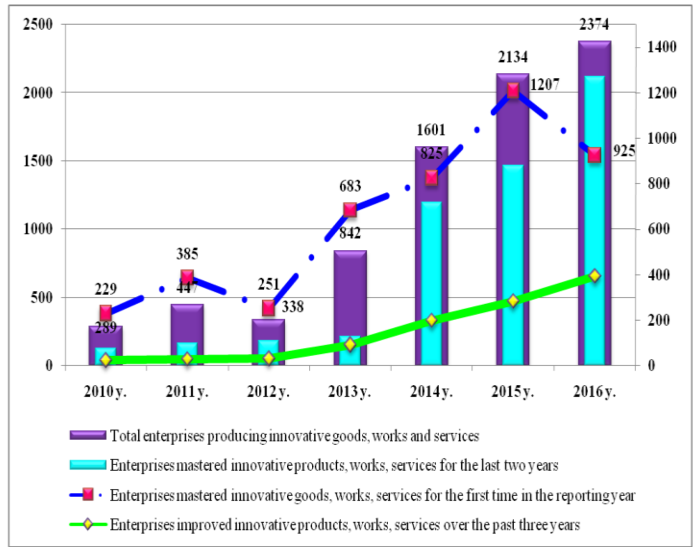
Reforms in the modernization of production in our country require not only the modernization of technologies and technological processes used in enterprises, but also an innovative approach to management and accounting. In this context, it is extremely important to study some aspects that are used in assessing products produced by an enterprise.

4 Statistics in Uzbekistan

The diagram below shows the dynamics of enterprises and organizations producing innovative goods, works and services on own account in recent years.

Figure 1

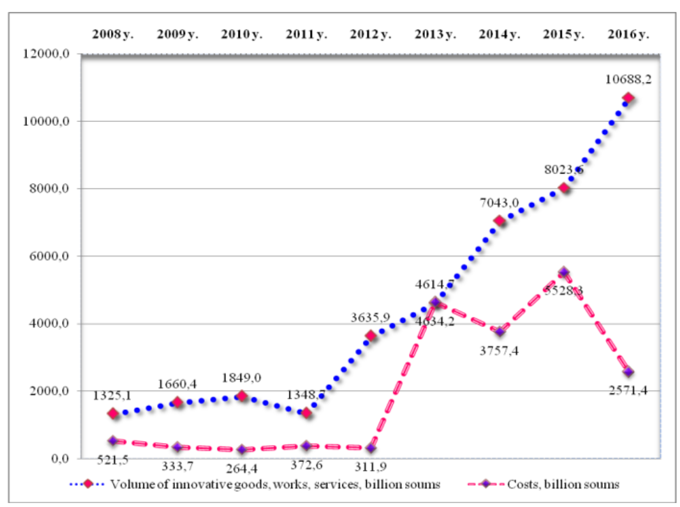
Number of enterprises and organizations producing innovative goods, works and services (2010-2016)



The number of enterprises and organizations producing innovative goods, works and services grew up 8 times from 2010 to 2016 from 289 to 2374 units. Enterprises that first mastered the production of innovative products, works and services increased by 696 units.

Figure 2

Dynamics of output and costs for innovative goods, works and services (2010-2016)



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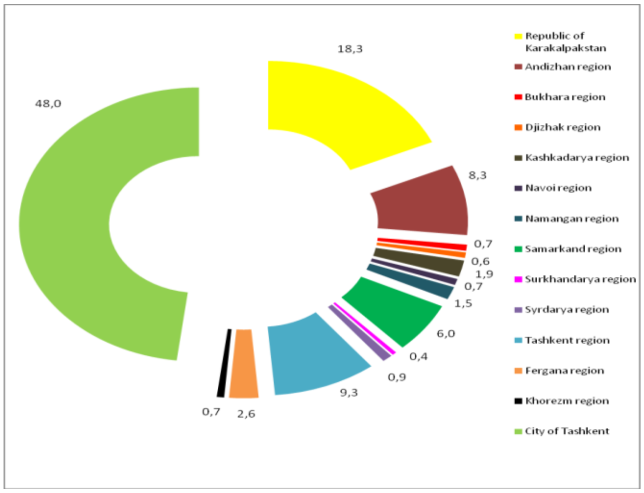
The volume of innovative goods, works and services in 2016 amounted to 10688.2 billion sums. This figure is 1.3 times more than in 2015 and 8 times as much as in 2008. The cost for innovations grew up 5 times compared to 2008, down 53 percent compared to 2015.

Figure 3

Volume of innovative products, works and services produced in 2016

(VAT and excluding tax)



In the context of territories in 2016, the share of innovative products, works and services in the city of Tashkent was 48 percent, the Republic of Karakalpakstan - 18.3 percent, Tashkent region - 9.3 percent and the Andizhan region - 8.3 percent, the rest regions - 16,1 percent.

Table 1

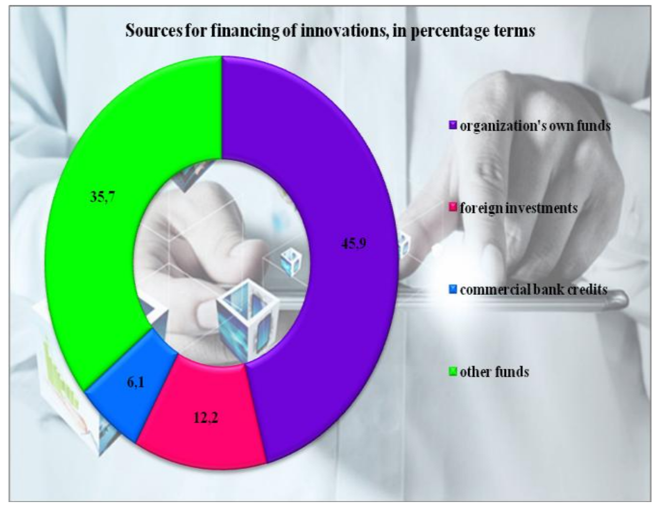
Costs of technological, marketing and organizational innovations by sources of financing, billion sums (2010-2016)

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Costs of technological, marketing and organizational innovations	**264,4**	**372,6**	**311,9**	**4634,2**	**3757,4**	**5528,3**	**2571,4**
of which by sources of financing:							
organization's own funds	184,3	263,2	213,4	2501,5	1381,5	1251,8	1180,0
foreign investments	48,3	24,9	39,9	1228,7	32,3	156,6	314,9
commercial bank credits	30,0	63,7	26,8	533,5	262,5	280,1	157,3
other funds	1,8	20,9	31,7	370,6	2081,0	3839,7	919,1

In 2010, innovations were financed mainly at the expense of the organization's own funds (69.7 percent). Since 2014, the share of other funds has increased (55.4 percent). In 2016, financing at the expense of the organization's own funds increased 6.4-fold compared with 2010.

Figure 4

Costs of technological, marketing and organizational innovations by sources of financing in 2016



In 2016, costs of technological, marketing and organizational innovations were financed at the expense of own funds - 45.9 percent (1180.0 billion sums), foreign capital - 12.2 percent (314.9 billion sums), commercial bank credits - 6.1 percent (157.3 billion sums) and other funds - 35.7 percent (919.1 billion sums).

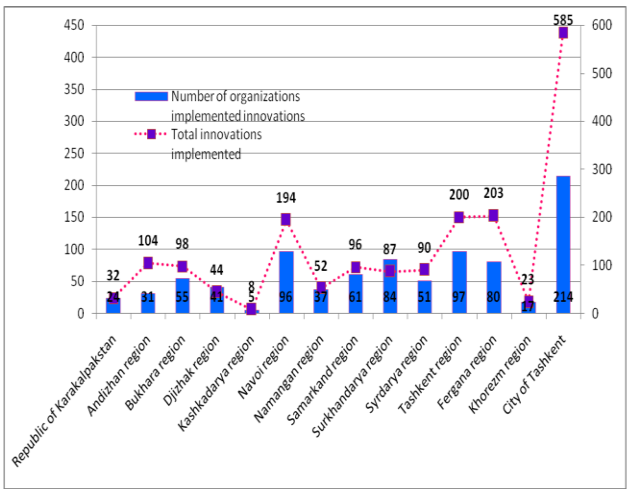
	otal	Of which developed:				
		on own account of organization	with other organizations	of which:		by another organizations
				with research institutions	with higher educational institutions	
Technological innovations	**816**	**1523**	**117**	**41**	**5**	**176**
of which:						
product innovations	118	973	73	15	4	72

process innovations	98	550	44	26	1	104
Marketing innovations	1	39	-	-	-	12
Organizational innovations	9	29	-	-	-	10

In 2016, 893 enterprises and organizations implemented 1816 types of technological innovation. Out of the implemented technological innovations 44 percent (799) belong to small enterprises and micro firms.

Figure 5

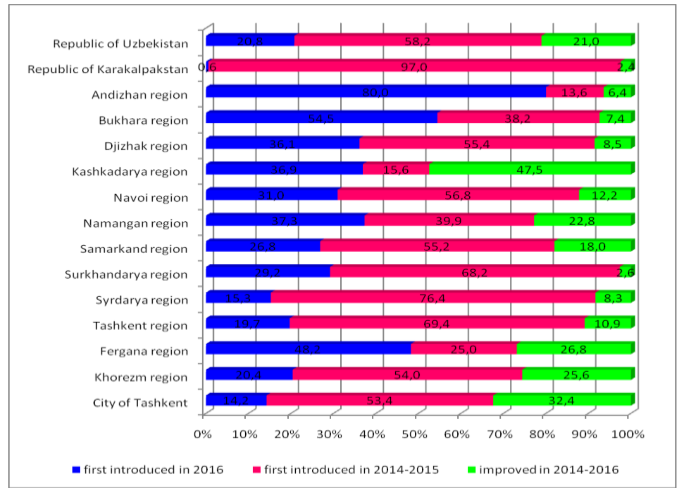
Number of organizations implementing innovations and number of innovations. (2016)



In 2016, each innovation-active organization introduced an average of 2 innovations. In particular, each innovative-active organization implemented 3 innovations in Andizhan region, Fergana region and in the city of Tashkent, an average of 2 innovations in Bukhara, Kashkadarya, Navoi, Samarkand, Syrdarya and Tashkent regions, an average of 1 innovation in the Republic of Karakalpakstan, Djizhak, Namangan, Surkhandarya and Khorezm regions.

Figure 6

Volume of production of innovative goods, works, services by time of innovation introduction



Innovations introduced in 2016 accounted for 20.8 percent (2221.5 billion soums) of the total volume of innovative products, works and services. This figure is 80 percent (709 billion soums) in Andizhan region and 54.5 percent (42.1 billion soums) in Bukhara region. In the Republic of Karakalpakstan and the Syrdarya region the most part of innovative products (97.0 percent and 76.4 percent respectively) falls on innovations implemented in 2014-2015.

5 CONCLUSION

The nascent, but fast-growing literature on the financing of innovation has made large advances in recent years. The literature has focused on several key themes. First, there is clear evidence that financing constraints have the possibility to be considerable in the context of firms engaged in R&D and innovation—with the ability to shape both the rate and the trajectory of innovation. Second, capital structure plays a central role in the outcome of innovations. Bank finance is an important source of finance, particularly for larger firms with tangible and intangible assets to pledge as collateral. Alternatively, public markets provide deep pockets but pose a set of agency costs that might be particularly harmful for firms engaged in exploration and novel innovations. Third, there is a growing interest in the multi-stage financing of innovation, both in established firms and startups, and understanding the optimal contracts and policies that might stimulate innovation. As we move towards a consolidation of knowledge in this field of study, there are a number of promising areas of further investigation, as well as best practices that might facilitate cross-study comparison of magnitudes and a deeper understanding of trade-offs involved. The first relates to measurement of innovation.

Finally, and perhaps most speculatively, we think that the role of adjustment costs in innovation deserves extra attention going forward. Much of the early work on corporate R&D describes important adjustment costs that lead to smoothing of innovative efforts. This protects special firm assets and also leads to particular financing needs.

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