

INNOVATION AND INNOVATIVE ENTREPRENEURSHIP IN THE REPUBLIC OF ARMENIA

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Abstract

Innovation is the driving force of economic progress which is often developed and mainly implemented by a separate group of enterprises which is defined as innovative enterprises. Although this is quite a new scientific field, innovative entrepreneurship is crucial for solving economic, social and environmental issues.

As a part of this research, we examined the current state of innovation and innovative entrepreneurship in Armenia based on local as well as international data sources. To determine the potential for innovation in the country, an analysis of Armenian and similar economies was performed.

Additionally, the government projects for innovation, innovative entrepreneurship and their role in the development of this field were examined. A study of the institutional environment for innovation was conducted and solutions for removing existing formal and informal barriers were discussed.

Key words: innovation, entrepreneurship, economic complexity, human capital, innovative entrepreneurship.

Introduction

Armenia had been one of the leaders in the Soviet Union in terms of scientific and technical development and innovative research since the 1950s and had a great reputation outside the Union. Armenia was especially notable for its achievements in the fields of space research, computing and navigation equipment. At present Armenia is unfortunately not a country known for innovation either in the world or even among post-Soviet States [1].

This is first evidenced by the trends in the economic complexity of Armenia which is calculated based on the diversity and complexity of export basket of the country. Thus, Armenia was ranked between 22 and 35 positions among 133 countries in terms of economic complexity from 1996 to 2002 being next to countries such as Norway, Hungary and even Canada.

Over the next 20 years, for several reasons, including the lack of technology, investment and innovation, the economy became less and less complex, creating less value-added which resulted in a sharp decline of about 50 positions.

Table 1

The rank of the countries with the economic complexity in 1996-2019¹

| Country | Median of position of the country | | | | Change | Graph |
|-----------------|-----------------------------------|-------------|-------------|-------------|--------|-------|
| | 1996 - 2002 | 2003 - 2009 | 2010 - 2014 | 2015 - 2019 | | |
| Armenia | 29 | 47 | 51 | 70 | -41 | |
| Azerbaijan | 70 | 117 | 124 | 121 | -51 | |
| Belarus | 27 | 26 | 26 | 30 | -3 | |
| Canada | 23 | 29 | 39 | 38 | -15 | |
| Estonia | 37 | 31 | 31 | 28 | 9 | |
| Georgia | 43 | 70 | 71 | 70 | -27 | |
| Croatia | 32 | 29 | 31 | 31 | 1 | |
| Hungary | 23 | 15 | 10 | 9 | 14 | |
| Iran | 106 | 98 | 98 | 77 | 29 | |
| Israel | 18 | 21 | 21 | 22 | -4 | |
| Kazakhstan | 67 | 81 | 97 | 84 | -17 | |
| Kyrgyzstan | 57 | 67 | 67 | 60 | -3 | |
| Latvia | 45 | 40 | 37 | 37 | 8 | |
| North Macedonia | 53 | 65 | 68 | 68 | -15 | |
| Norway | 26 | 32 | 36 | 36 | -10 | |
| Poland | 25 | 23 | 23 | 23 | 2 | |
| Russia | 33 | 49 | 62 | 58 | -25 | |
| Slovakia | 18 | 16 | 15 | 14 | 4 | |
| Slovenia | 14 | 12 | 13 | 11 | 3 | |
| Tajikistan | 90 | 114 | 114 | 113 | -23 | |
| Turkey | 56 | 46 | 42 | 40 | 16 | |
| Ukraine | 31 | 38 | 43 | 46 | -15 | |

This decline in economic complexity was among the ten sharpest in the world during 1996-2019 and can be explained by an example: in the global market, the competitiveness of industrial products processed in Armenia, such as processed rubber, fell below that of the natural rubber, resulting in a replacement of worldwide exports of processed rubber with exports of natural rubber.

Another common indicator used to analyze is the Global Innovation Index (GII). It consists of two main sub-indices: Innovation input and Innovation output. These sub-indices, in their turn, are divided into several other sub-indices called pillars. The multiplicity of these indicators, as well as the availability of data sets, make it possible to identify existing problems and analyze them by making time series and cross economy analyses.

Thus, according to the Global Innovation Index, Armenia ranks 69th out of 132 countries, which is lower than neighboring Georgia (63rd) but higher compared to Azerbaijan (80th).

It should be taken into account that in contrast to comparable neighboring countries², both Georgia and especially Azerbaijan have recently registered a positive trend by GII index, while in the case of Armenia there is only a fluctuation without a demonstrable trend. Thus, if the pace of innovation in Armenia remains the same, Armenia will probably be out of competition with comparable countries, as it is known that lacking innovation leads to a reduction in the volume of competitive products.

¹ The table was developed by the author based on data developed by Harvard Growth Lab, available at <https://atlas.cid.harvard.edu/rankings>,

² Georgia and Azerbaijan were selected as comparative countries for the analysis of chronological series of indicators. The choice is based on close preconditions, which are: being in the same region, having a post-Soviet history, post-independence warfare, GDP per capita, etc.

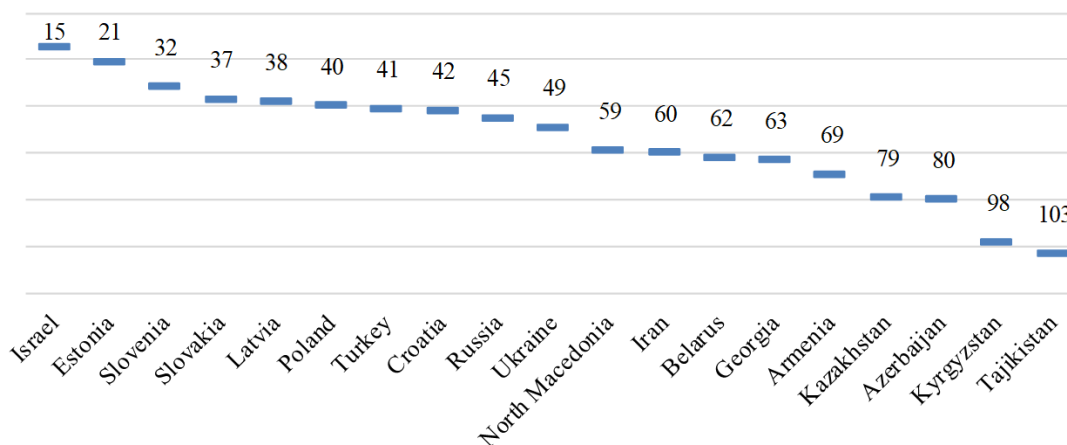


Fig. 1 GII rank of countries, Armenia and several selected countries, in 2021

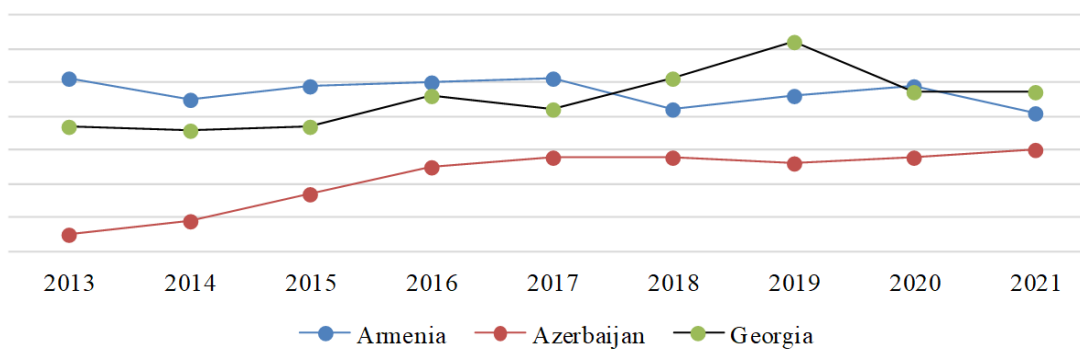


Fig. 2 GII rank of Armenia, Georgia and Azerbaijan in 2013-2021

It is worth mentioning that in the Human Capital and Research pillar, Armenia was ranked 94th among the 132 countries in 2021, falling behind all of the observed countries including Azerbaijan (89th) and Tajikistan (85th). Nevertheless, Armenia is ranked relatively high (64th) in the Knowledge and Technology Outputs pillar, even ahead of Turkey and Russia. Additionally, Armenia has a relatively high Creative Output ranking, 49th out of 132 countries. According to one of the indicators included under this pillar, named “Number of Wikipedia edits per million people”, Armenia is the second in the world with a score of 88.9, a consequence of the program for the development of Armenian content in Wikipedia.

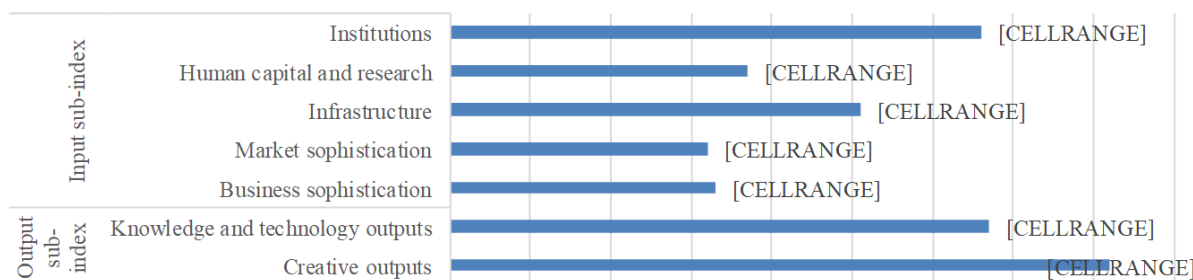


Fig. 3 Armenia GII rank among 132 countries in terms of seven pillars, 2021

In general, our analysis of the results of the GII methodology shows that in terms of input indicators (Institutes, Human Capital and Research, Infrastructure, Market

Sophistication, Business Sophistication) Armenia is in a weaker position than in terms of output (Knowledge and Technology Output, Creative Output). In other words, in the case of low entry conditions, Armenia provides relatively high results.

Conflict setting

During the last decade, due to the increase in the level of globalization in Armenia, especially in the field of ICT, an attempt has been made to bypass the issue of inefficient institutional environment and finance. As a result, several IT companies³ founded and operating in Armenia today, have succeeded in implementing global innovations and registered tremendous success. In addition, these companies, which are examples of innovative enterprises, have affiliates registered overseas, mostly in the USA, which makes easier funding attraction, results in better infrastructure (particularly, in terms of receiving payments) and eases the effect of low reputation of Armenia in the field of technology. However, this harms the opportunity of developing an innovative ecosystem of entrepreneurship in Armenia.

To be able to assess the level of innovative entrepreneurship and the issues in this field, there are two sources of relatively recent statistical data on innovative entrepreneurship in Armenia: the “Pilot Survey of Innovative Activities of Legal Entities - Individual Entrepreneurs” conducted by the Statistical Committee of the RA in 2017 [3, p.10] and Global Entrepreneurship Monitor: Armenia National Report 2019/2020 (GEM) [2].

Thus, data shows that 4 out of 5 people in Armenia say, “Other people consider them very innovative”. With this indicator, Armenia is in the top ten countries with the highest self-assessment of innovativeness in the world (8th out of 50 and 2nd out of 9 Eastern European countries) [2, p.111-112]. In contrast, Armenia ranks 27th among 50 countries in terms of innovative products and 36th in terms of innovative processes, which is incomparably lower than the self-assessment of innovation. Accordingly, Armenians consider themselves innovators, however, in practice being innovative and initiative are not sufficiently implemented. [2, p.18, 56]:

This difference shows how much the level of innovation in the country is overestimated. It should be noted that this phenomenon exists in other countries as well, but Armenia is among the leaders in terms of overestimation [2, p.111-112].

Firstly, this difference can be explained by the region and nationality [2, p. 57]. Secondly, one of the reasons is probably the sharp decline in the level of innovations registered compared to the previous century, which was already presented above. In other words, innovation in society, based on habit, is perceived as a positive phenomenon, but in practice, due to various factors, Armenia has not been distinguished by innovations for a long time.

Product innovation is more common among enterprises in Armenia while the level of process innovation is low, which can be explained by the lack of investments. However, there are many marketing innovations which is explained by their low cost.

The type of economic activity is crucial for the level of innovation of the enterprise, as some activities in the economy are not related to innovation by their nature. In particular, in Armenia the level of innovation in the fields of administrative support (N), electricity (D), water (E), construction (F) and warehousing (H) is very low. It is not surprising that the

³ Such as Picsart, Teamable, Krisp, Zangi, Menu Group, Shadowmatic (Triada Studio), EasyDmarc, GlobalR)

highest level of innovative entrepreneurship in Armenia is in the field of professional and scientific-technical activity (M) as by its nature the field is aimed at scientific-technical research and developments.

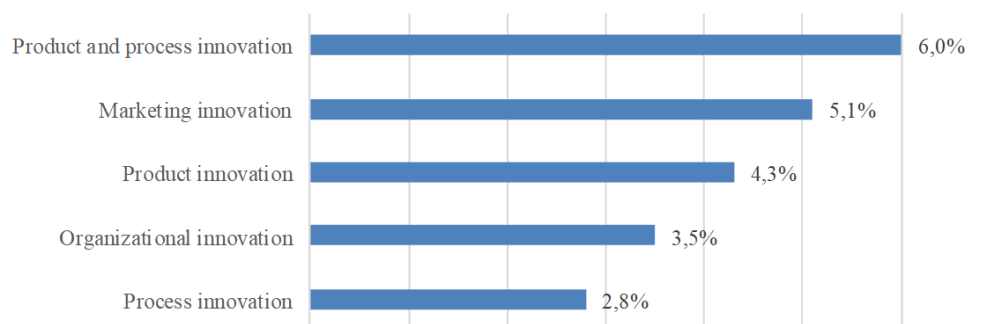


Fig. 4 The share of innovative enterprises in the total number of organizations [3, p.10]

It should be noted that the service sector has the lowest level of innovation which may explain why in Armenia enterprises prefer product innovation rather than process innovation (Fig 4).

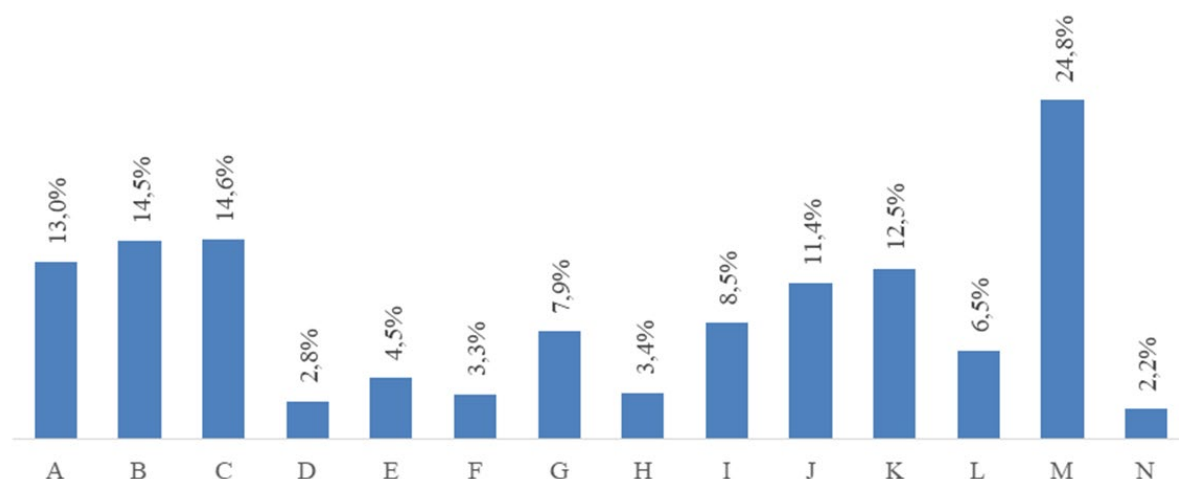


Fig. 5 The share of innovative enterprises in the total number of enterprises by NACE rev. 2

Another important fact about innovation is that, unlike medium enterprises, small innovative enterprises are often not able to innovate or research on their own, while almost 2/3 of medium and large innovative enterprises succeed in the implementation of innovation by internal forces [3, p.10].

An expert survey also shows the lack of access to R&D in companies. According to the GEM export survey, Armenia has a rather low position in the world in terms of access to new R&D and technologies among emerging companies (39th out of 54 countries).

Solving this problem can be the key to finding the solution to another important issue: the weak commercialization of scientific innovation. It is known that the level of R&D transfer from universities and scientific centers to enterprises is one of the weakest in Armenia (52nd out of 54 countries) [2 p. 143]. According to the expert survey, “the reason is the lack of state support for R&D. In addition, engineers and scientists do not receive support to objectify their ideas and invest in new enterprises” [2 p.143].

Research results

The solution to the problem of R&D transfer could be the idea of creating a “Structure for support to order for science from business” [4] envisaged within the framework of the Government's 2021-2026 program. The objectives of this structure are defined as the study of existing developments in science with an intent of future commercialization and their integration in the commercialization process providing advisory services and legal assistance. If this new structure works effectively, it can become an essential link in the creation of innovative enterprises through existing innovations, besides, it will have a significant impact on the promotion of science and R&D. In addition, we can expect an increase in the number of innovative enterprises as well as improved efficiency.

At the same time, the reason for not engaging in innovative entrepreneurship is not only the weak commercialization of innovation or science but also the financial barriers. This is evidenced by a study conducted by the Statistical Committee of RA, according to which companies that have considered innovation but have not implemented it due to barriers, cite insufficient financial resources among the most probable reasons for not implementing it. In the second place is the lack of banking or private capital, which in fact can be identified also as financial barriers.

According to entrepreneurs, no less important obstacles are the market demand, competitors and the lack of relevant employees which additionally need a more comprehensive analysis.

However, as we see, the issues most emphasized by entrepreneurs are related to financing. The same conclusion can be reached after the international comparison of R&D spending. Particularly, according to UN estimates, spending on R&D do not exceed 0.3% of GDP in Armenia while the average in low-income countries is 0.58%, in middle-income countries: 1.73%, in high-income countries: 2.59%, in Israel: 4.95%.

The role of scientific developments and innovation by the state has always been emphasized in government budget programs. It should be noted that recently the Government of the RA has taken certain actions to solve the problem of innovation funding, mostly by increasing funding for science. It is based on the governmental policy of providing solutions to problems in various areas through innovation, which is repeatedly emphasized in the Government program for 2021-2026. These are from such areas:

- Investments (“The primary target of investment policy is faster, more flexible processes for the implementation of innovative, new knowledge-generating programs [4, p. 25]”).
- Neutralization of economic risks (“Innovative support toolkit will neutralize existing risks in the economy for investment projects that ensure economic complexity [4, p. 26]”),
- Energy (“continuous programs will be implemented to have knowledge-based smart energetic infrastructures supporting the implementation of new educational programs, new research and innovation [4, p. 55]”),
- Export (“The way to increase international competitiveness will be to create an export-oriented, knowledge-based and inclusive economy” [4, p. 23]),
- Poverty (“increasing the well-being of the middle class and reducing poverty through the development and realization of human creative skills” [4, p. 23]).

It should be noted that one of the most important formal institutions directly involved in innovation is tax and customs administration which is an important point to consider when implementing such large-scale plans.

In the Republic of Armenia, the key law in the sphere is the Law on State Support to Innovation Activities adopted on May 23, 2006, which “determines the legal and economic bases for formulating and implementing the state innovation policy including any forms of support for innovation activities” [6]. In this law, the main provisions of the innovation activity are outlined, including the legal basis (Article 3), its types and entities (Article 4, 5), the purpose of state support, its goals, and main objectives (Article 6, 7) and several other provisions.

Based on this law, by the decree No. 1466-N of October 19 of the same year “On defining the priorities of the development of the innovation sphere” [7] the priorities of the sphere development were defined:

- creation and development of innovation infrastructures,
- alternative energy sources,
- high-tech developments,
- introduction and development of technologies that contribute to the environment.

Several years later, in 2011, the “Initial Strategy for Innovation Economy Development” was launched and Armenia started to promote innovation developing its innovation system.

That is, although the bases for the regulation of the legal framework are mainly present in the Republic of Armenia, from the point of view of comprehensive regulation of the sphere, there is a need to establish proper legal formalities for the unresolved key issues. First, it is a question of defining the foundations of institutional reforms [8, p. 24]. In addition, the existing legislative acts and concepts are essentially outdated. Finally, public revenue collection policies do not encourage innovation.

Conclusion

As the research shows after independence Armenia has had a sharp decline in innovative activities which is proven by the analysis of the index of economic complexity. Furthermore, the current level of innovation is overestimated in the country.

As evidenced by Armenia's lower-than-average level of innovative entrepreneurship, the conditions for innovation are not favorable. In addition to the weak commercialization of science and R&D, financial barriers are another major reason for not exercising innovative entrepreneurship. At the same time, we found out that a low level of innovative entrepreneurship is associated with an absence of an institutional ecosystem which includes formal norms. Particularly, there is a need for comprehensive regulation of the law on innovation, including the timeliness of existing legislation and the concept of state revenue collection policy which does not promote the development of innovative activities.

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ՆՈՐԱՐԱՐՈՒԹՅՈՒՆԸ ԵՎ ՆՈՐԱՐԱՐԱԿԱՆ ԾԵՌՆԱՐԿԱՏԻՐՈՒԹՅՈՒՆԸ ՀԱՅԱՍՏԱՆԻ ՀԱՆՐԱՊԵՏՈՒԹՅՈՒՆՈՒՄ

Թարփոշյան Հ.Վ.

Հայաստանի Հանրապետության պետական կառավարման ակադեմիա

Նորարարությունը տնտեսության առաջընթացի շարժիչ ուժն է, որը հաճախ մշակվում և հիմնականում իրագործվում է ձեռնարկությունների առանձին խմբի՝ նորարարական ձեռնարկությունների կողմից: Այս ոլորտը բավականին նոր գիտական ուղղություն է, թեև նորարարական ձեռնարկատիրությունը կենսական դեր է խաղում տնտեսական, սոցիալական և բնապահպանական հիմնախնդիրների լուծման գործում:

Սույն հետազոտության շրջանակներում, նախ, ուսումնասիրվել են Հայաստանում նորարարության և նորարարական ձեռնարկատիրության առկա վիճակը՝ հիմնվելով տեղական և միջազգային աղբյուրների վիճակագրության վրա: Հասկանալու համար նորարարական ձեռնարկատիրության ոլորտում երկրի ներուժը, կատարվել է համամատական վերլուծություն՝ համեմատելի տնտեսություններում համադրելի տվյալների միջոցով:

Ուսումնասիրվել է նաև կառավարության կողմից նորարարությանը և նորարարական ձեռնարկատիրությանը ուղղված ծրագրերը և դրանց դերը ոլորտի զարգացման գործում: Բացի դրանից, գնահատվել է նորարարության համար ինստիտուցիոնալ միջավայրը և ներկայացվել են առկա ֆորմալ և ոչ ֆորմալ խոչնդանների հաղթահարման տարբերակներ:

Բանալի բաներ. նորարարություն, ձեռնարկատիրություն, տնտեսության բարդություն, մարդկային կապիտալ, նորարարական ձեռնարկատիրություն:

ИННОВАЦИИ И ИННОВАЦИОННОЕ ПРЕДПРИНИМАТЕЛЬСТВО В РЕСПУБЛИКЕ АРМЕНИЯ

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Инновации являются движущей силой экономического прогресса, который часто разрабатывается и внедряется в основном отдельной группой предприятий, инновационными предприятиями. Хотя это довольно новая научная область, инновационное предпринимательство имеет решающее значение для решения экономических, социальных и экологических проблем.

В рамках этого исследования мы изучили текущее состояние инноваций и инновационного предпринимательства в Армении на основе местных, а также международных источников данных. Чтобы определить потенциал для инноваций в стране, был проведен анализ армянской и аналогичных экономик.

Кроме того, были рассмотрены проекты правительства в области инноваций, инновационного предпринимательства и их роль в развитии этой области. Также было

проведено исследование институциональной среды для развития инноваций, а также решений по устранению существующих формальных и неформальных барьеров.

Ключевые слова: инновации, предпринимательство, экономическая сложность, человеческий капитал, инновационное предпринимательство.

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