

DOI: <https://doi.org/10.53486/cike2022.01>  
CZU: [339.137+330.34+001.895]:[061.1EU+338(478)]

## INTERNATIONAL COMPETITIVENESS, PRODUCTIVITY AND INNOVATIONS

**Alexandru Stratan**

ASEM, alex\_stratan@yahoo.com

**Victoria Fala**

NIER, [fala.victoria@ince.md](mailto:fala.victoria@ince.md)

**Abstract.** *The countries that seek to increase their wealth and the wellbeing of their population should promote policies to increase their competitiveness and therefore to strengthen their ability to obtain decent incomes on external markets from the sales of goods and services they produce.*

*Exports are a mean to avoid the small size of the internal market. They let companies to increase economies of scales by extending the market, to specialize and improve production processes and their products and services. Exporting companies may have access to a more sophisticated demand, to new knowledge, technologies. Thus increasing exports should spur aggregate productivity and economic growth. On the other side exports performance is a reflection of a country competitiveness.*

*The competitive advantage of countries depends on the ability of companies to innovate and upgrade and the national environment is very important in this regards (Porter, 1990).*

*The objective of the research is to evaluate the innovation environment, productivity and international competitiveness of the Republic of Moldova comparing to Central European countries. Some of the conclusions the authors have drawn from the undertaken research are as follows. Moldova rank significant lower comparative to the benchmark countries as concerns the innovation input sub index and knowledge impact index of the Global Innovation Index produced by Global forum of intellectual property. The knowledge impact expressed in production and exports complexity, labor productivity growth, and high tech exports of total trade is small that explains the share of Moldova in the world export market.*

**Keywords:** international competitiveness, technological intensity of exports, productivity, innovations

**JEL Classification:** F43, F68, O47

### **Introduction**

Republic of Moldova is a small European economy that is implementing the Association Agreement with EU since 2014 and on June 2022 it was granted the EU candidate status. An important task for decision makers is to foster structural reforms and to reduce the development gap with other EU countries.

Previous researches concluded that Moldova lags far behind the developed European countries as concerns the GDP per capita and the productivity level that is an important factor for economic development (Stratan A., Toaca Z., Fala V., 2021). Small productivity is associated with a low international competitiveness measured as world market share of trade in goods and services compared to other former European transition economies that are now EU members and have the status of developed economics. International competitiveness is

also measured by exports sophistication that result from the complexity of the economy that in turn explains the size and change of world market shares.

Despite the big gap in GDP per capita compared to the benchmark countries from Central Europe – Poland, Czech Republic, Croatia, Estonia, Latvia, Lithuania, Slovakia, Slovenia, Romania, Bulgaria, Turkey - the economic growth in Republic of Moldova is slowing down in long term, and a part of this trend is explained by a decelerating Total Factor Productivity that used to be an important factor of growth during the last two decades (World Bank, 2019). At the same time, the business environment does not encourage entrepreneurship or capital accumulation.

Moldova’s little progress to increase productivity and international competitiveness can be explained by a low performance in developing innovations. Although there have been implemented many reforms to improve business climate and to foster innovations the number of enterprises that implement some innovations is small and is decreasing over the last years. According to the National Bureau of Statistics, during 2019-2020 only about 1 out of 10 surveyed enterprises with more than 10 employees have made some innovations and this number has declined since the last surveys made for 2017-2018 and 2015-2016 years.

Increasing population income from sustainable sources by fostering productivity growth and developing opportunities for entrepreneurship and innovations is of the general objectives of the National Development Strategy 2030 draft. Thus many public commitments should be made to achieve the established targets by this period, including exports acceleration to a 10% annual average during 2020-2030 and increasing Global Innovation Index Rank score from 32,3 in 2021 to 42 in 2022-2025 and to 45 by 2026-230.

### **Literature review**

According to Ketels Ch. (2010), the ability of a country to generate high productivity explains its capacity to compete internationally and to gain incomes form trading abroad goods and services and vice versa.

According to Porter (1990) a country’s competitive advantage and the sophistication of its export basket depends on the ability of companies to innovate and upgrade. To be innovative, means for companies to identify those activities were they can create a higher value added today or in the future preserving at the same time the valuable production factors that can emigrate in the condition of open economies (Porter, M., 1990).

Many empirical researchers have found a causation between exporting activity of firms and innovations (Hashmi H.M.A., Voinea C.L., Ooms W., Caniels M., C., J., 2022; Ortigueira-Sánchez L. C., Welsh D. H. B., [Stein](#) W, 2022; Filipescu D.A., Prashantham S., Rialp A., Rialp J, 2013). The existing works argue as well for the relevance of different type of innovations on export performance of firms, highlighting especially the importance of technological innovations. They confirms the importance of public support in supporting exports through innovations, including by offering innovations subsidies and the opportunity offered for firms by converging innovation and export promotion policies (Ortigueira-Sánchez L. C., Welsh D. H. B., [Stein](#) W, 2022). At the same time Recica F, Hashi I., Jackson I., Krasniki B. (2018) researching innovations and the export performance in Transition countries concluded that in medium reforming countries like Moldova process innovation and product

upgrading are especially important to spur exports activity of firms. At the same time in the most reforming countries that is introducing new products by firms contributes more to increasing exports performance of firms. A study performed for Republic of Moldova confirms that firms that are introducing product and services innovations are more productive, innovations entailing 4% productivity premium (World Bank, 2016).

As Porter says in “The competitive advantage of nations” (1990), “in a world of increasingly global competition, nations have become more, not less, important. Differences in national values, culture, economic structures, institutions, and histories all contribute to competitive success”. The business environment created by governments is very important to support or prevent entrepreneurship and innovations. And there are many policy options and areas of Government interventions to improve innovations performance in a country. According to Jaumotte, F., Pain N., (2005) every kind of public policy has either a direct or an indirect impact on factors that affect innovative activity. Thus the Government interventions to sustain innovations are not limited to investments in research and development (R&D) activity, despite their extremely important role (Veugelers, R., 2021). According to Sandu S. and Ciocănel B. (2014) increasing R&D expenditures in the business sector as a share of GDP by 1% will lead to the growth of high-tech export share in total merchandise exports by + 3.68% in the same year in 26 EU countries. At the same time, investments in R&D in the public sector has a delayed positive effect on the high-tech merchandise export. With a 5 year lag they will lead to a growth of high tech manufacturing exports share by 14.42%.

In this context it is important for every economy to identify the main constrains that should be eliminated in view to stimulate innovations and productivity growth.

The aim of this paper is to identify the challenging factors for developing innovations in Republic Moldova comparative to Central European Countries in order to address some public policy needs in order stimulate aggregate productivity growth and international competitiveness improvement in Republic of Moldova.

### **Data and methods**

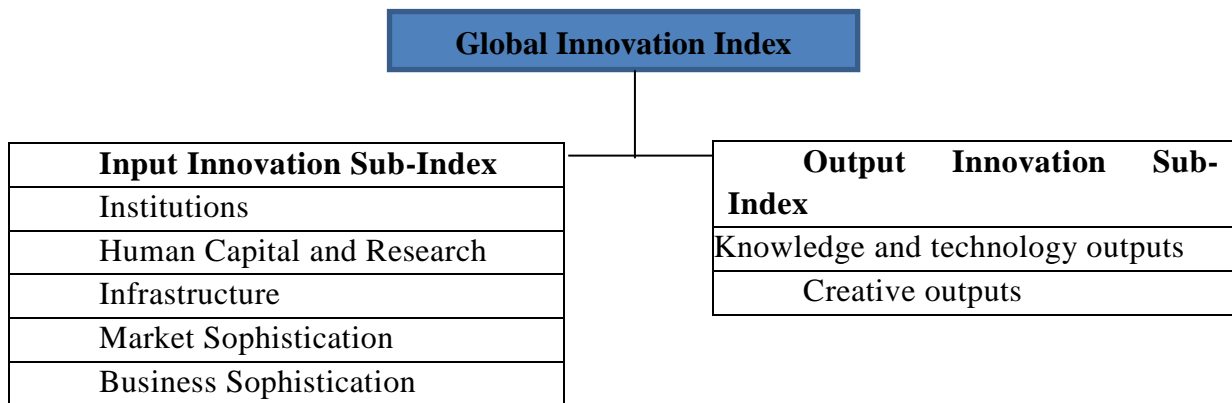
Within this research the international competitiveness has been evaluated using the export market share and exports complexity index. The first is computed both for exports of goods and services using data from UNCTAD database. The Economy complexity index (ECI) and technological intensity of exports has been used to compare the complexity of Moldova’s exports to those of benchmark countries. ECI is a relative measure of an economy knowledge intensity produced by The Observatory of Economy Complexity. It is used by World Intellectual Property Organization (WIPO) to measure complexity of production and exports basket, while computing Innovation Output sub-index within the Global Innovation Index. The level and growth rate of labor productivity has been estimated in constant USD PPP. Estimations have been made by authors in a previous work (Stratan A., Toaca Z, Fala V., 2021), although labor productivity have been estimated in this work based on recalculated data on GDP due to new statistics on population number that have changed after the 2014 population census. New population number data refers to population with usual residence in Republic of Moldova. Thus the data on labor productivity for Moldova consists from a broken series of

data (2014-2018, 2019-2021) due to changes in methodology of employment statistics. Data on GDP for 2021 are preliminary. To compute labor productivity for Moldova and benchmark countries there have been used the data of the National Bureau of Statistics from Moldova, World Bank, UNCTAD and Eurostat. The indicator has been computed for Moldova and 12 Central European countries: Hungary, Czech Republic, Poland, Estonia, Latvia, Lithuania, Bulgaria, Romania, Slovakia, Slovenia, Croatia, Turkey according to the formula below (formula 1).

**Labor productivity =**

$$\frac{\text{GDP national currency in 2017 base year * PPP conversion rate 2017}}{\text{Employed population of 15 years and over}} \quad (1)$$

The Global Innovation Index data have been used to benchmark Moldova’s innovation performance comparative to Central European Countries across Input Innovation sub-index pillars (figure 1) and some Innovation results – productivity and production and exports complexity.



**Figure 1. Global Innovation Index structure**

Source: Global [innovation Index 2021. What is the future of innovation-driven growth \[online\]. WIPO 2021](#)

**Discussions and results**

Because of the small size of the Moldovan economy, local companies have to import and export in order to increase their productivity and, accordingly incomes from selling in the local market and abroad what they produce. Exporting and importing is important for enterprises to grow. At the same time, the exports performance of Moldova is rather small comparative to benchmark countries.

The economic openness of Republic of Moldova is relative low comparative to other small countries in Central Europe – Latvia, Lithuania, Estonia. Moldova exports and imports less relative to its GDP. Exports of goods and services in Republic of Moldova account for less than 1/3 of GDP compared to 80% in Lithuania and 64% in Latvia (2021). The Ratio of exports to imports in Moldova is small. Exports covers only 53% of the imports of goods and services.

Small exports of goods compared to imports causes a huge current account deficit in Moldova. It reached 1,6 bilion USD or about -11,6% of GDP in 2021. The current account imbalance is persistent in time increasing the risks of economic development of the country.

Moldova gains only a small share of world market of goods and services comparative to other small territorial countries in Central Europe and progresses to increase it are small over time (table 1).

**Tabelul 1. Share of world market, %**

Country	Services			Country	Merchandise		
	2011	2021	Change 2021/2011		2011	2021	Change 2021/2011
Moldova	0,022	0,027	0,005	Moldova	0,012	0,014	0,002
Latvia	0,107	0,094	-0,013	Latvia	0,072	0,094	0,022
Slovenia	0,154	0,162	0,008	Estonia	0,091	0,097	0,005
Estonia	0,126	0,165	0,039	Croatia	0,073	0,102	0,029
Bulgari	0,166	0,182	0,016	Lithuania	0,153	0,183	0,030
Slovakia	0,162	0,186	0,024	Bulgari	0,154	0,183	0,030
Lithuania	0,124	0,253	0,129	Slovenia	0,189	0,256	0,066
Croatia	0,271	0,278	0,007	Romania	0,344	0,392	0,048
Hungary	0,502	0,433	-0,070	Slovakia	0,435	0,465	0,030
Czech Republic	0,560	0,493	-0,067	Hungary	0,612	0,636	0,024
Romania	0,269	0,547	0,278	Turkey	0,736	1,011	0,275
Turkey	0,919	0,944	0,025	Czech Republic	0,889	1,016	0,127
Poland	0,889	1,337	0,448	Poland	1,029	1,516	0,487

Source: Author’s calculation based on UNCTAD Statistics

During the transition period the commodity and geography structure of external trade has changed and diversified while EU became the main trade partner. Moldova imports mainly goods for processing, transport and travel services, and a wide range of goods: including mineral products, machinery and transport equipment, chemical products, foods and others. At the same time, it exports mainly goods after processing (insulated wires, clothes, footwear), agrifood products, IT, travel and transport services. Although Moldova has a Revealed Comparative Advantage for the production of many goods, the value added of exports is rather low even of the products that would be normally considered medium-high technological intensive (example: products from automotive industry). The exports of high technological intensive products are small and remains rather unchanged during the last two decades (table 2).

In the Table 2, it can be seen that countries in Central Europe with a higher score of economy complexity exports more high technological products as a share of total merchandise exports. Moldova ranks significantly behind the Central European countries as concerns world export market share, share of high technological intensive products in total merchandise exports, the economy complexity and GDP per capita.

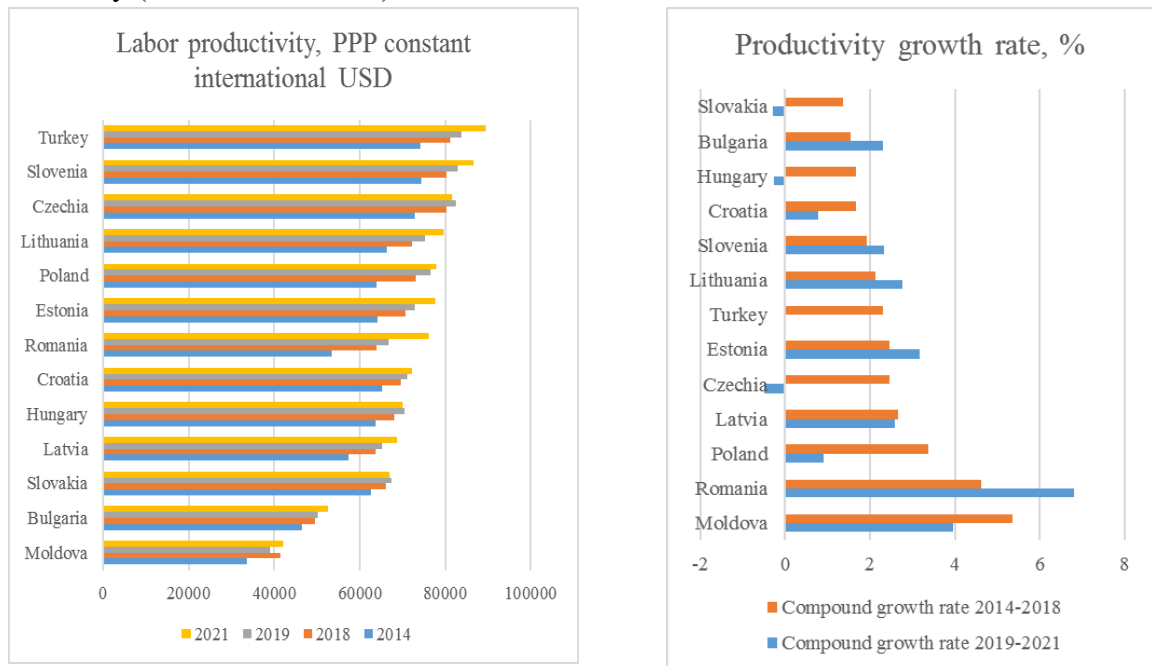
**Tabelul 2. Countries by Economy Complexity**

Country Economy Complexity ranking (2020)	Country	Country Economy Complexity score (2020)	GDP per capita, USD PPP (2021)	Share of High technological intensive products in total merchandise exports, % (2021)
6	Czech Republic	1,78	44261	27
9	Hungary	1.54	36753	23
11	Slovenia	1,54	43625	15
13	Slovakia	1,43	33010	16
26	Poland	1,02	37503	14
19	Romania	1,27	35414	10
27	Estonia	0.99	42192	18
29	Lithuania	0,86	42665	9
32	Croatia	0,80	33800	9
35	Latvia	0.71	34469	12
39	Bulgaria	0,63	26705	9
41	Turkey	0,63	30472	4
63	Moldova	-0,04	15637	2

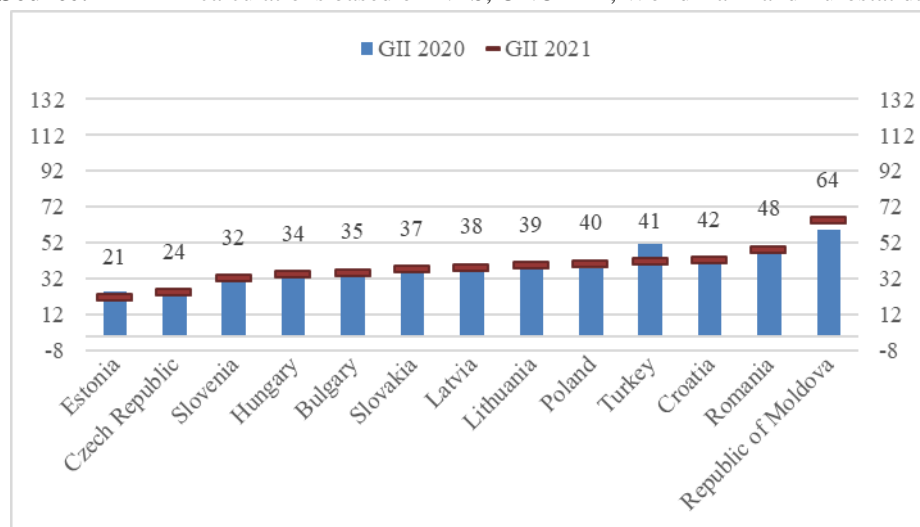
Source: Harvard Growth Lab, Atlas of Economic Complexity, World Bank, WITS

Labor productivity is significant lower comparative to other Central European countries. It increased at a relative higher rate comparative to many benchmark economies, although during 2014-2018 the growth in labor productivity was supported including by a negative trend in number of employed persons. There are some concerns in this regard. First of all, employment rate in Moldova is very low, while NEET rate is very high and a trend of population ageing is recorded. The second refers to the relative slow growth rate of labor productivity if consider the significant big gap between Moldova and Central European countries. Total Factor Productivity growth significantly slowed down during the last decade. The economy structure hinders productivity growth and it is changing at a slow pace, while Moldova has arrears in implementing reforms to develop a functional market economy (Stratan A., Toaca Z, Fala V., 2021). Agriculture and food industry accounts for an important share of total GDP in Moldova. With some exceptions, labor intensive economic activities used to be most attractive to local and foreign entrepreneurs. At the same time access to labor force and its quality became one for the most major constraints of the entrepreneurs in Republic of Moldova (World Bank, 2019; Vinogradova N. et all, 2021). The capital level per employed person, private credit to GDP ratio and FDI inflows per employed person is very low. During the last decade some economic activities that are medium-high knowledge and technology intensive like TIC services and automotive industry have developed. At the same time, even in these sectors the sales level per employed person is low comparative to the average on economy. There is little progress to shift

the resources from low to high productive sectors, and to stimulate entrepreneurship and firms’ innovation activity (World Bank, 2019).



**Figure 2. Labor productivity, PPP constant international USD**  
 Source: Author’s calculations based on NBS, UNCTAD, World Bank and Eurostat data



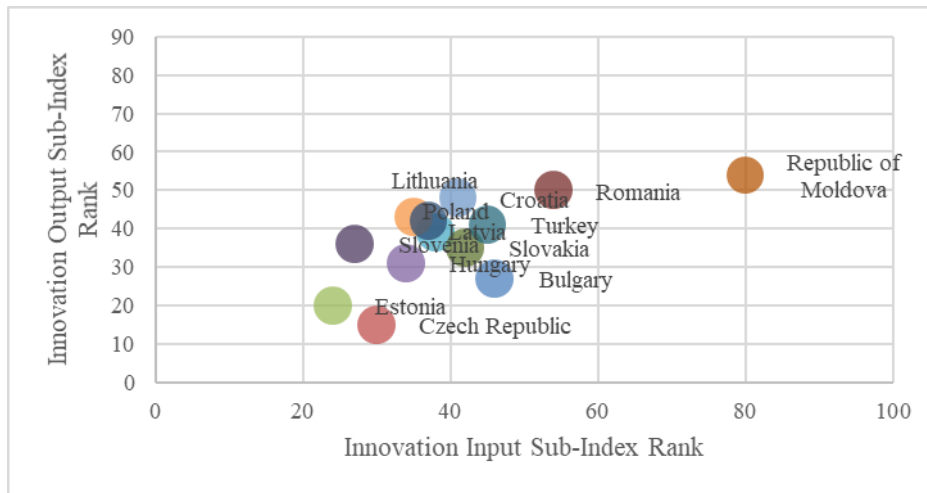
**Figure 3. Change in GII rank of Moldova and Central European countries, 2020-2021**

Source: Author’s calculations based on NBS, UNCTAD, World Bank and Eurostat data

There is no doubt that innovations are very important for productivity growth, economic and social development of a country. It is imperative for enterprises to be innovative to succeed in in the global market that where competition is stiff. The challenges faced by the world, regional and national economy in the last 2 decades – the 2008 crisis, the crisis caused by the Covid-19 pandemic, the war between Russia and Ukraine highlighted the importance of innovations in view to overcome different challenges related to supply of row materials and production factors, export of goods, and threats to economic security of countries. With a score of 32.3 out of 100, which is

half of the score of the country with the best performance in the field (Switzerland), the Republic of Moldova ranks 64th out of 132 countries evaluated in the ranking of the Global Innovation Index 2021. Compared to 2020 year, Moldova went back in the ranking 5 positions.

Although Moldova is evaluated with a higher GII score comparative to its development level, there are some important aspects to be considered. As previous analyzed indicators, Moldova stand far behind other Central European countries as concerns investments and policies made to stimulate innovations and, accordingly the innovations outputs.



**Figure 4. Innovation Input Sub-Index versus Innovation Output Sub-Index for Moldova and Central European countries**

Source: WIPO (2021). Global Innovation Index 2021. Tracking Innovation through the Covid-19 Crisis

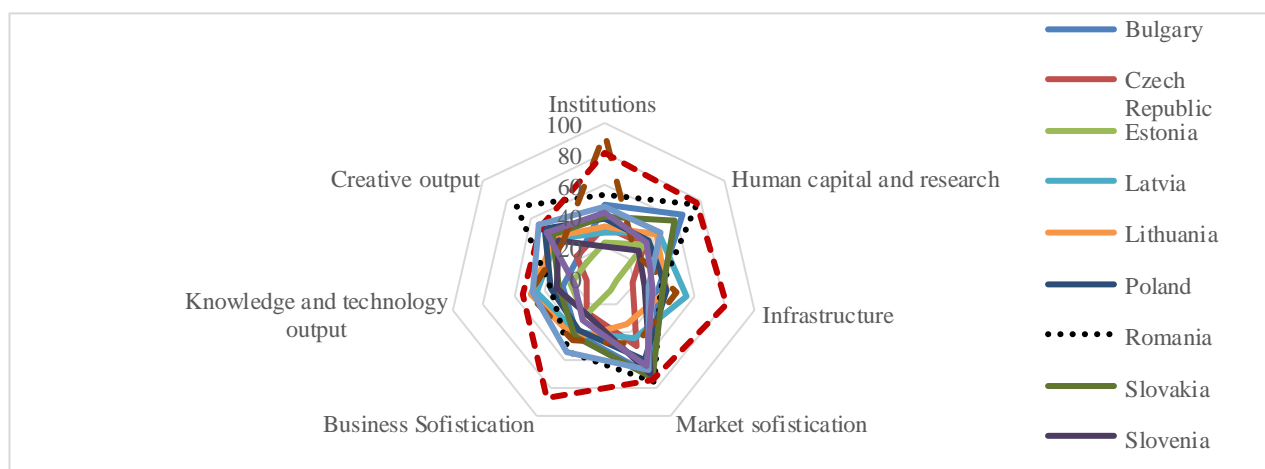
With some exceptions Moldova ranks behind the benchmark countries for almost all 5 pylons of the Innovation Input Sub-Index that are intended to stimulate innovations (figure 5). Although the gap is especially large in areas like: quality of institutions, business sophistication and infrastructure. Some of the weakest points that give to Moldova a low score across these three pillars in the ratings are political stability and the state of low. Although the lowest score and the biggest gap is recorded for the Business sophistication pillar because of weak business linkages and state of cluster, as well as firm expenditures in the R&D activities as a share of GDP. As mentioned above only a small share of enterprises are making innovations and one third of them are performing only organizational and marketing innovations. Thus there are necessary more state incentives to strengthen entrepreneurship, to support innovative ideas to turn into successful business including process and product innovations. They are mandatory to overcome many supply and distribution challenges linked to very small market and many constrains raised by the Covid-19 world economic crisis and the Russia-Ukraine war.

Infrastructure is another pillar of Innovation Input Sub-Index very low ranked comparative to all benchmark countries. According to many survey (World Bank, 2019; Stratan A., Vinogradova N., Novac A., Maier L., Ianiogo A., 2021) infrastructure is less challenging for enterprises comparative to other major obstacles like quality of institutions, quality of labor force, informality and corruption, tax rates, access to finances. Moldova is a land lock country that rely significantly on road infrastructure, that is perceived as the worst among other components of



infrastructure and that is deteriorating over time (Stratan A., Vinogradova N., Novac A., Maier L., Ianiogo A., 2021). International ratings put Moldova among the countries with the poorest logistic quality and GDP per unit of energy. On the other side Moldova has made significant progress and has some regional strengths in terms of information and communications infrastructure. Although additional efforts are needed to be strengthen ICT access and use. Moldova has a high score and an advanced position in the ranking in terms of the ease of doing business, but the constraints mentioned above, among others, discourage both the creation of enterprises and the sustainability of the businesses created, their level of sophistication

Another very important innovation input pillar is Human Capital and Research. Research and development expenditures as a share of GDP and number of researcher per million inhabitants are two targets of the ninth Sustainable Development Goal “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”. Although the amount of expenditures in R&D in Moldova represented 0.23% of GDP in 2021 that is very small comparative to 1.99% in Czech Republic, 2.15% in Slovenia, 1.79% in Estonia, 1.61% in Hungary, 1.39% in Poland, 1.16% in Lithuania, 0.71% in Latvia according to the World Bank data for the 2020 year. In 2020, 89% of expenditures for R&D have been made in the public sector, the share decreasing to 81% in 2021. Despite the low level of researchers per 1 million inhabitants, the number of researchers is decreasing in Moldova, while the sector is facing a lot of challenges that makes an appeal for improving the public policy in this area.

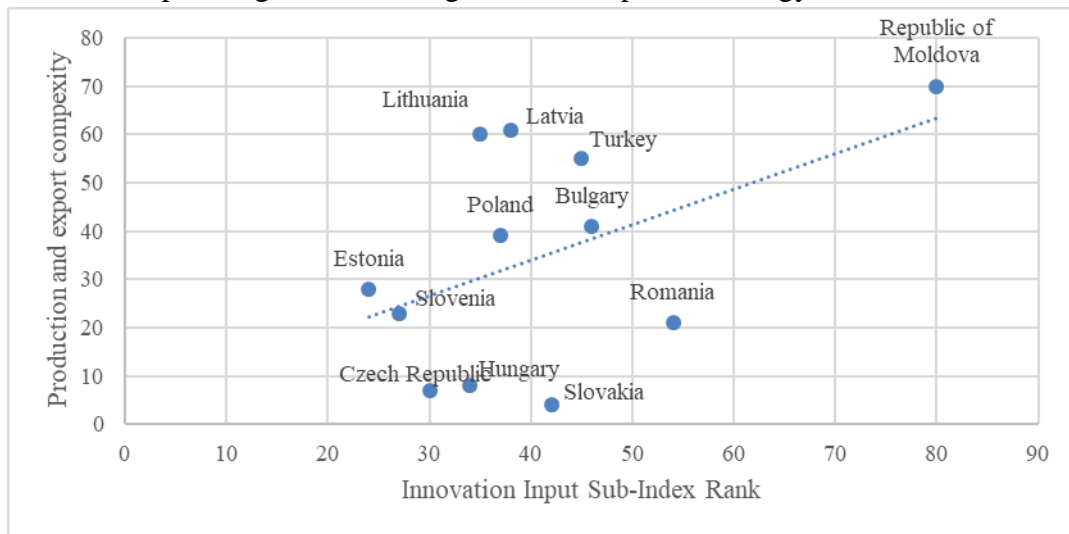


**Figure 5. Moldova and Central European countries across the 5 pylons of the Innovation Input sub-index and 2 pylons of Innovation Output sub-index.**

Source: WIPO (2021). Global Innovation Index 2021. Tracking Innovation through the Covid-19 Crisis

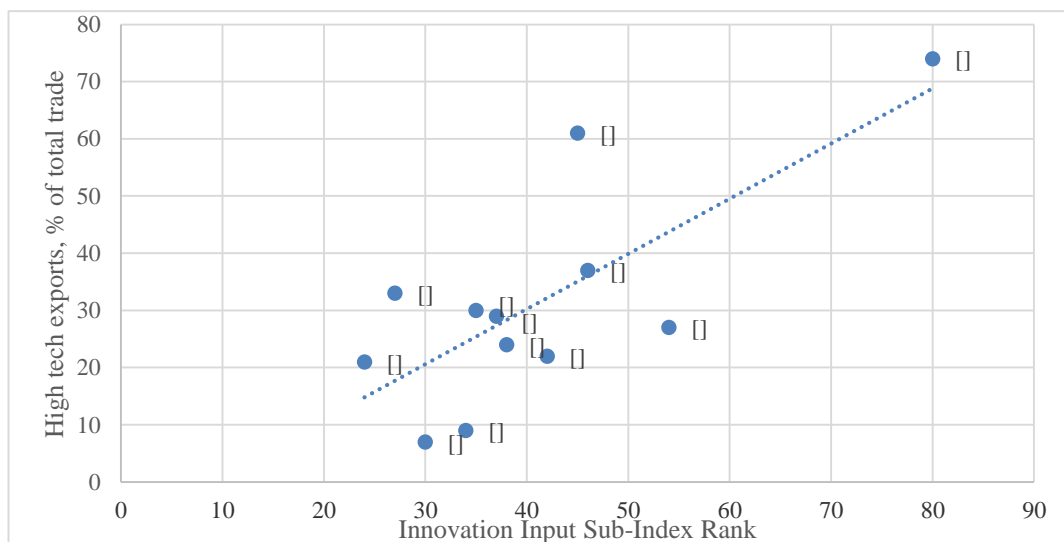
The low level of Moldova's rank in the Innovation Input Sub-Index correlates with a low position of the country in the ranking in terms of productivity growth, the complexity of production and exports, which in turn explains the low share of technology-intensive exports in the total value of foreign trade of Moldova. Therefore, the Republic of Moldova ranks 74th in the GII 2021 in terms of the share of exports of technology-intensive products in total trade, recording an extremely large gap compared to the countries of Central Europe. The country ranks better in terms of knowledge creation (34 out of 132 countries worldwide) compared to knowledge dissemination (51 out of 132) and knowledge impact (104 out of 132) the last being measured by the mean of 5 indicators – productivity growth, new business density per 1000 people of age

15-64, software spending ratio to GDP, ISO 9001 quality certificates per billion PPP\$ GDP and high-tech manufacturing, %. Moldova is lagging behind the most Central European countries especially as concert the density of new business ISO 9001 quality certificates and manufacturing production. That confirm the previous results that supports the necessity to create a favorable business environment favorable for business creation and development by implementing more product and process innovations, becoming more complex and productive. This way will be developed premises for an increase in international competitiveness and achievement of innovation and export targets within long term development strategy.



**Figure 6. Production and export complexity versus innovation inputs**

Source: Elaborated by authors based on WIPO (2021). Global Innovation Index 2021. Tracking Innovation through the **Covid-19 Crisis**



**Figure 7. High-technology exports versus Innovation input sub-index rank**

Source: Elaborated by authors based on WIPO (2021). Global Innovation Index 2021. Tracking Innovation through the **Covid-19 Crisis**

**Conclusions:**

- Republic of Moldova is hardly competing on international market to increase its share in world export. Although during the last two decades there have been made little progress to

increase the share of world market for merchandise exports from Moldova that is significant smaller comparative to other economies from Central Europe with similar population size and territory;

- The low International competitiveness is explained by a reduced complexity of the economy, that ranks Moldova the 70<sup>th</sup> out of 132 countries as concerns high tech manufacturing and production and export complexity in GII 2021. The share of high technological intensive products in total merchandise exports account for about 2% comparative to 18% in Estonia, 12% in Latvia, 10% in Romania, 9% in Lithuania. Thus Moldova lag behind Central European countries on increasing production and exports complexity, international competitiveness and income per capita;

- Labor productivity is increasing faster comparative to the benchmark economies during 2019-2021, except Romania, but the gap between the labor productivity level is significant just as in the case of previous mentioned indicators. The intensity of capital is low, while TFP is slowing since the 2008-2009 world crisis;

- The above mentioned results makes Moldova in an unfavorable position in the GII 2021 ranking comparative to Central European countries as concerns the knowledge impact and dissemination;

- Business sophistication, institutions quality and available infrastructure are three pylons that determines innovation inputs were Moldova is recording the biggest gap comparative to benchmark countries in the rank;

- Some insights for public policy to foster innovation activity in Moldova are:
  - ✓ increasing institutions quality and diminish costs of doing business;
  - ✓ improving key infrastructures: logistic services, energy production, access and use of internet, energy sustainability etc.;
  - ✓ developing innovation linkages through increasing university-industry collaboration, business investments in R&D activities or increasing business demand in R&D services, developing clusters etc;
  - ✓ increasing investments in R&D sector in the public sector. The empirical results for EU countries shows that increasing public expenditures in R&D activity will have a long term impact on exports technological intensity, making them more intensive in high technology, while investments in R&D in the private sector will produce effects in short-run.
  - ✓ diversifying and facilitating access of business to external financing sources, developing the risk capital;
  - ✓ human capital development by increasing school life expectancy, tertiary enrollment.

#### REFERENCES:

1. Berkum, S., Meijl, H. The application of trade and growth theories to agriculture: a survey. The Australian Journal of Agricultural and Resource Economics, 2002. Disponibil la: <http://ageconsearch.umn.edu/bitstream/117851/2/1467-8489.00123.pdf>;
2. BIRD/World Bank. Enterprise Survey 2019. Washington: WB, 2019. Disponibil: <https://www.enterprisesurveys.org/en/data/exploreeconomies/2019/moldova#regulations-and-taxes>;

3. BIRD/World Bank. Enterprise Survey 2019. Washington: WB, 2019. Disponibil: <https://www.enterprisesurveys.org/en/data/exploreconomies/2019/moldova#regulations-and-taxes>;
4. Bykova, A. Competitiveness in Central, East and Southeast Europe. Prezentare în cadrul cursului Competitiveness, Growth & Crisis. WIIW, 2021;
5. Filipescu D.A., Prashantham S., Rialp A., Rialp J. Technological Innovation and Exports: Unpacking Their Reciprocal Causality. [\*Journal of International Marketing\* 21\(1\):23-38, March 2013.](#) DOI: [10.2307/23488026](https://doi.org/10.2307/23488026);
6. Hashmi H.M.A., Voinea C.L., Ooms W., Caniels M., C., J.. The Impact of Breakthrough Innovations on the Export Performance of SMEs in Developing Countries: The Moderating Role of Institutional Factors. *Front. Psychol.*, 12 May 2022 Sec. Educational Psychology <https://doi.org/10.3389/fpsyg.2022.888697>;
7. Jaumotte, F. and N. Pain (2005), "An Overview of Public Policies to Support Innovation", OECD Economics Department Working Papers, No. 456, OECD Publishing, Paris, <https://doi.org/10.1787/707375561288>.
8. Ketels K. Export Competitiveness: Reversing the Logic. Disponibil: <https://hbswk.hbs.edu/item/export-competitiveness-reversing-the-logic>;
9. Ortigueira-Sánchez L. C., Welsh D. H. B., [Stein](#) W. Innovation drivers for export performance. [\*Sustainable Technology and Entrepreneurship\*, Volume 1, Issue 2., May–August 2022, 100013.](#) <https://doi.org/10.1016/j.stae.2022.100013>;
10. Porter, M., 1990. The comparative advantage of Nations. Harvard Business School Publishing.
11. Recica F, Hashi I, Jackson I, Krasniki B. Innovation and the export performance of firms in Transition Economies: the Relevance of the Business Environment and the Stage of Transition. [\*International Journal of Entrepreneurship and Small Business\* Vol. 38, No. 4.](#) December 2019. <https://doi.org/10.1504/IJESB.2019.104141>;
12. Sandu, S., Ciocănel, B. Impact of R&D and Innovation on high - tech export. *Procedia Economics and Finance* 15 (2014) 80 – 90. Disponibil: <https://reader.elsevier.com/reader/sd/pii/S221256711400450X?token=8FEBDF04AAB8A8D303ECBDD278E7F743FE1836BA132A9C53761243E5DADC60AF03D0D1C6F7BA0E6F9E7375C94371C64D&originRegion=eu-west-1&originCreation=20221104083824>.
13. Stratan A., Vinogradova N., Novac A., Ianioglo A., Maier L. Assessment of the entrepreneurial ecosystem in the Republic of Moldova: opinion of entrepreneurs. *Annales Universitatis Apulensis series Oeconomica Journal*, Issue 2, No23, 2021;
14. Stratan A., Vinogradova N., Novac A., Ianioglo A., Maier L. Assessment of the entrepreneurial ecosystem in the Republic of Moldova: opinion of entrepreneurs. *Annales Universitatis Apulensis series Oeconomica Journal*, Issue 2, No23, 2021;
15. Stratan, A., Toacă, Z., Fala, V.. Progresele reformării economiei moldovenești în vederea asigurării tranziției sale la economia de piață. In: *Creșterea Economică în Condițiile Globalizării = Economic Growth in the Conditions of Globalization: conferința internațională științifico-practică, ediția a XV-a, 15-16 octombrie 2021. Institutul Național de Cercetări Economice. Chișinău: INCE, 2021, vol. 1, pp. 159-173.*
16. Veugelers, R. (2021) ‘Research and innovation policies and productivity growth’, Working Paper 08/2021, Bruegel;
17. World Bank, 2015. *Republic of Moldova Trade Study*. Report No: ACS17523 . The International Bank for Reconstruction and Development/ The World Bank, 2015.
18. World Bank. *Rekindling Economic Dynamism: Moldova*. Washington: International Bank for Reconstruction and Development / The World Bank, 2019. Disponibil: <file:///C:/Users/victoria.clipa/Downloads/Moldova-Rekindling-Economic-Dynamism.pdf>;