

DOI: <https://doi.org/10.53486/cike2023.01>

UDC: 654.022:338.47(478)

INFRASTRUCTURE AND INTERNATIONAL COMPETITIVENESS: TRENDS AND CHALLENGES¹

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Abstract: During the last few years, the business and Governments in the region should operate in an extremely uncertain environment caused by the Covid-19 pandemic crisis and the Russian-Ukrainian war consequences. Moldova is not an exception, sharing a common frontier with Ukraine and recording frequent economic declines during the last decade as a reaction to many shocks. Moldovan authorities are more than ever concerned with improving competitiveness and increasing enterprises resilience. Given the importance of infrastructure in consolidating international competitiveness, the Moldovan public authorities continue to invest in developing infrastructures especially: road and telecommunication ones. Many services and programs are provided and implemented for enterprises to become more competitive and resilient to internal and external shocks, to facilitate their internalization. The goal of the present research is twofold: to present the main trends and challenges for improving Moldova’s international competitiveness and the second, to evaluate the impact of infrastructure and services provided by Government for business to increase their competitiveness and to facilitate internationalization. In order to carry out the study a quantitative and qualitative research have been undertaken using national and international statistic data, researches and official reports, the results of the business survey carried out in 2022 within the applied research project 20.80009.0807.38 „Multidimensional assessment and development of the entrepreneurial ecosystem at the national and regional level in order to boost the SME sector in the Republic of Moldova”, financed from the state budget of the Republic of Moldova. The main conclusions of the research states about the modest results of the Republic of Moldova to become more competitive internationally and of the Government to support enterprises to cope with some critical challenges that hinders them to boost productivity, and become more competitive and resilient to crisis. At the same time while the telecommunication infrastructure is becoming better due to many public policy incentives, it is not accessible for business from different regions at the same extent, while the road infrastructure is yet a critical challenge for enterprises operating both in the Chisinau city (the capital and the largest city in Republic of Moldova) as well as in other regions of the county.

Keywords: road infrastructure, transport services, telecommunication infrastructure, international trade, competitiveness.

¹ The paper contains the results of the research projects 20.80009.0807.38 „Multidimensional assessment and development of the entrepreneurial ecosystem at the national and regional level in order to boost the SME sector in the Republic of Moldova” financed from the State Budget carried out within the National Institute of Economic Research of the Academy of Economic Studies from Moldova in 2022.

JEL Classification: H54, F10, L26, O18

Introduction

The competitiveness of Moldova's exports in regional profile is low despite the policies promoted by policy makers to stimulate exports. The Republic of Moldova has an extremely high merchandise trade deficit, which makes the current account strongly unbalanced during the transition to a market economy. At the same time, the very low share of Moldova in world exports, points to the national economy competitiveness challenges.

The national public policy framework of the Republic of Moldova, that support economic development, assigns an important role to strengthening the country's export capacities. One of the goals of the "Moldova 2020 National Development Strategy" was to change the economic development model from one based on remittances, consumption and imports to one supported by investment and exports. The "National Strategy for Investment Attraction and Export Promotion 2016-2020" aimed at "increasing the value and diversification of exports". Thus, accelerating the growth of exports of goods and services is one of the indicators by which will be measured the achievement of the Goal 1 of the National Development Strategy "European Moldova 2030" - "increasing the income of the population from sustainable sources and alleviating inequalities". Given the high importance of physical infrastructure to support business internationalization and for building a competitive and resilient economy, in conditions of its poor quality in Moldova, it represents one of the priority objectives in many strategic development policy documents.

The Sustainable Development Goals refers to structural transformation, industrialization, technological advancement, economic diversification and productivity growth of countries. This is a production and job creation oriented approach. It involves boosting production, employment and per capita income to increase population and reduce poverty. At the same time, it encourages to reduce the dependence of production and foreign exchange inflows from export of primary goods, by using efficiently human and physical capital, the innovative capacity of the business environment, infrastructure and the effectiveness of public policies (UNCTAD, 2018).

Empirical studies made by Rehman F., Noman A., Ding Y. (2020) applying Pooled Mean Group estimator and cointegration techniques like Pedroni and Kao test confirmed the significant positive long-run impact of aggregate and separately transports, telecommunication, energy and financial infrastructure on exports. Other researches like Donaubauer J, Glas A, Meyer B, Nunnenkamp P (2018) concluded in their research paper that infrastructure has significant positive effects on trade, by reducing trade costs. Adversely, “missing infrastructure explains part of missing trade flows”. Ben Shepherd and John S. Wilson (2007) also showed using Gravity model simulations that better roads quality is associated with higher intraregional trade flows in Europe and central Asia. Improving roads could increase trade by 50% over baseline.

Methodology and data

The competitiveness of exports has been assessed within the research based on the share of current account and trade balance deficit to GDP, world export market shares and change in technological

structure of merchandise exports. Both national and international statistics has been used to evaluate the main trends in international competitiveness.

The impact of services provided by Moldovan Government for business to increase their competitiveness and to facilitate internationalization and of the existent infrastructure on doing business has been assessed for the 2022 year, when Moldovan economy has been hit by an economic crisis caused by Russia-Ukrainian war. Also have been analyzed the changes in the business perception aftermath the recession triggered by Covid-19 pandemic. The impact has been assessed using the data obtained from the business survey carried out in 2022 within the applied research project 20.80009.0807.38 "Multidimensional assessment and development of the entrepreneurial ecosystem at the national and regional level in order to boost the SME sector in the Republic of Moldova". The methodology was elaborated within the above mentioned project and has been described in details by Stratan et al. (2021). To evaluate the impact of the infrastructure component and its factors and sub-factors on entrepreneurship, the variation of the 5-point Likert-style scale was used, which includes five possible points for evaluating the factors: i) "Significant obstacle" =-2; ii) "Insignificant obstacle"=-1; iii) "Not an obstacle"=0; iv) "Insignificant incentive (advantage)"=+1; v) "Significant incentive (advantage)"=+2. Based on the results the Coefficient of the entrepreneurial ecosystem's assessment (Kee) have been computed. The coefficient was calculated according to the formula (1): $Kee = (-2) * \% \text{ sign.obst.} + (-1) * \% \text{ ins.obst.} + (+1) * \% \text{ ins.adv.} + (+2) * \% \text{ sign.adv.}$ where the % represents the share of responses within one of the 4 responses (significant obstacle, insignificant obstacle, significant advantage, insignificant advantage). The values of the Kee can obtain values from „- 2” (minimum - all respondents indicate a significant negative impact of the factor on the development of entrepreneurship) to „+2” (maximum - absolutely all respondents indicate on the significant positive impact of the factor on the development of entrepreneurship). Kee = „0”, if the number of positive evaluations is equal to the number of negative ones, characterizing the neutral impact of the factor on the development of entrepreneurship (Stratan et al., 2021). The questionnaire took place in June-October, 2022 with the participation of 204.

Results and discussions

Moldova is a transition country in Europe that is running rather a consumption lead economic growth model fueled by imports despite government efforts to change it in an exports and investments fueled economic growth model (Toaca Z., Fala V., 2022). The economic openness computed as the share of the sum of external trade to GDP is significant lower comparative to many countries of the same territorial size in Central Europe, accounting for 88% in 2019 and 2021, while in 2020 it declined to 79%. In 2022 uncommonly it increased to 111% being done the accelerated growth of both exports and imports while GDP decreased by 5.9%.

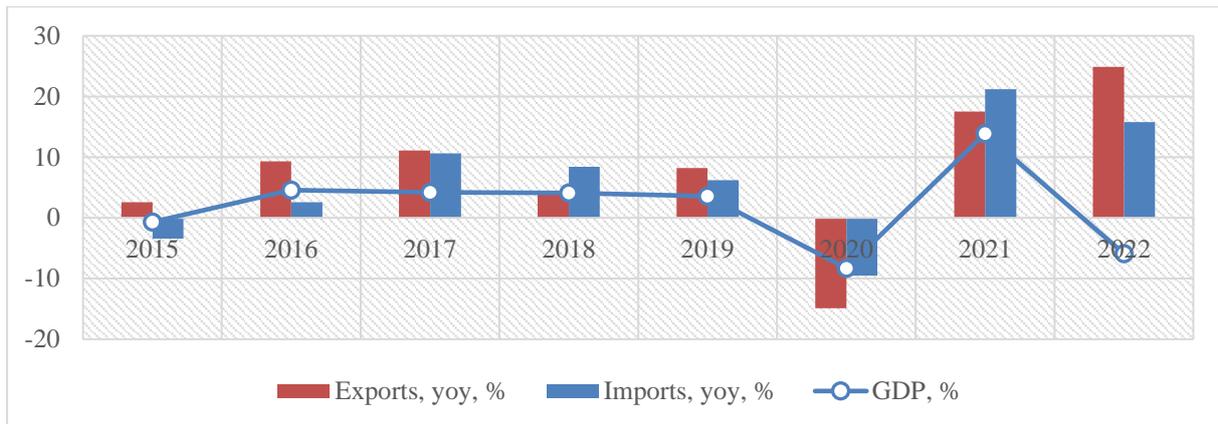


Figure 1. Dynamics of external trade and economic growth in Republic of Moldova, %
Source: Author’s calculations based on National Bureau of Statistics data

Both exports and imports of goods and services are small in Republic of Moldova if compared to Baltic countries that have roughly the same population number and territory size. At the same time merchandise imports coverage by exports is tinny that causes a huge deficit of merchandise trade balance and of the current account. Merchandise trade balance recorded the highest deficit as a share of GDP in 2021-2022 since 2015. Thus the current account deficit amounted to 2,3 mld. USD or -15,7% of PIB in 2022 exceeding very much the value of the current account balance of many Central and East European countries.

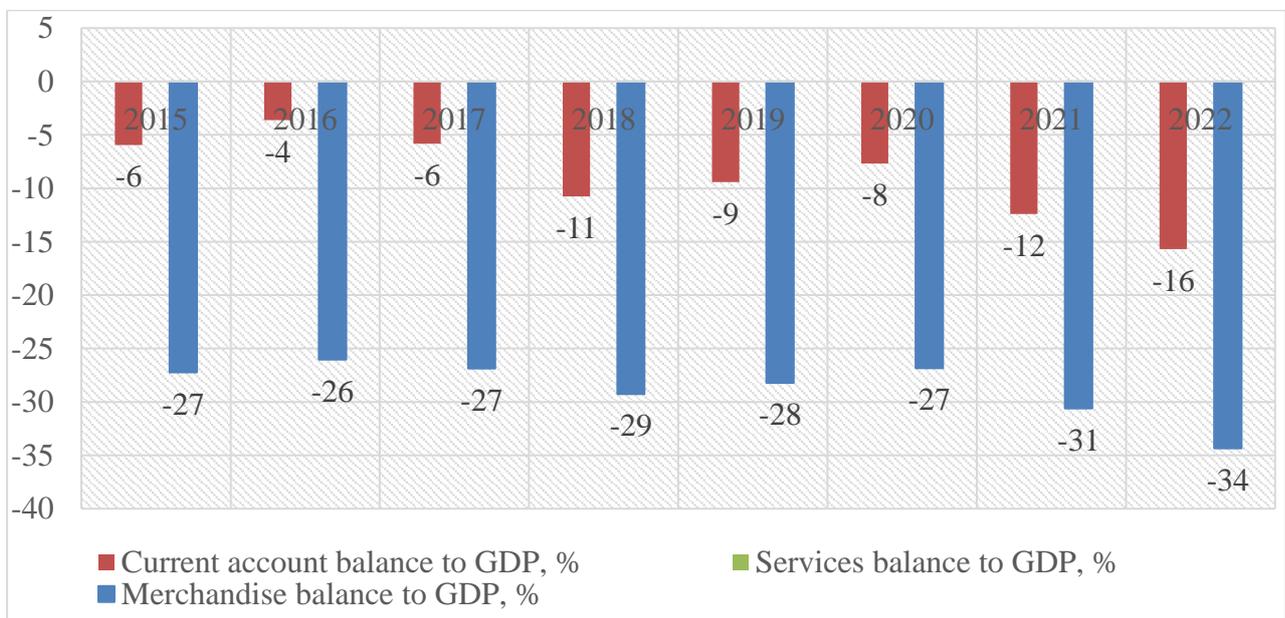


Figure 2. Share of the current account and trade balance in GDP, %
Source: Author’s calculations based on National Bureau of Statistics and National Bank data

The economy has been hit badly by the Russian – Ukrainian war in 2022, but not foreign trade which seems to have been encouraged by the existing conjuncture of factors. In 2022, merchandise exports amounted to 4335.1 million USD, a value 37.9% higher than in 2021 and imports 9219,1 million

USD, 28,5% more than in 2021. In 2022 merchandise exports have been boosted, especially by re-exports to Ukraine and by exports of agricultural products being done the decline in Ukraine external offer of oil seeds and cereals and the good harvest in 2021 (Bush C., 2023). Re-exports represent 31.6% of total exports, increasing by 1.9 times compared to 2021 thus contributing to exports growth by 20.9%. After the economic recession caused by Covid-19 in 2020, external trade rose very fast. External trade in services also recorded a fast growth in 2022, exports increasing by 39%, and imports by 18% compared to 2021 values, amounting 2275 million USD and 1371 million USD. During 2020-2022 exports and imports of merchandise and services exceeded by almost 4 times the average growth rate recorded in 2015-2019. External trade acceleration was supported by increase in both trade volumes and unit value as the war in Ukraine led to sharp rises in commodity world prices (WTO, 2023).

In contrast to external trade of Moldova, world trade slowed down in 2022, especially because of fall in merchandise exports volume growth rate to 2,7% compared to 9,4% in 2021. At the same time, the value of world merchandise exports increased by 11% to, partly due to spiking prices for energy and other primary products, while services exports increased by 16% yoy (WTO, 2023). The fast growth of Moldovan exports comparative to worlds exports lead to a hike in Moldova’s share in world exports of merchandise and services that is critically small when compared to most countries in Europe.

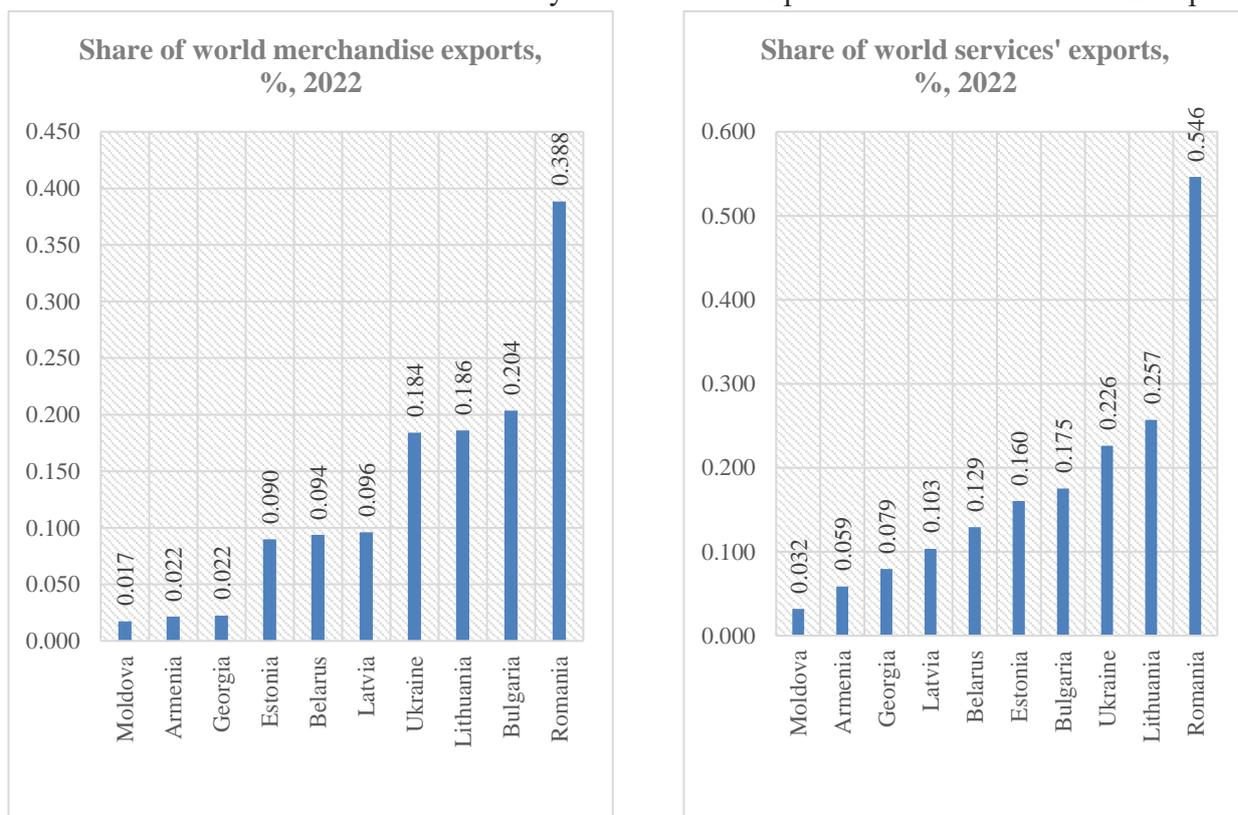


Figure 3. Moldova’s share in world exports, %

Source: UNCTAD Stat

Ukraine involvement in the war, which is a major world producer and exporter of grain, has heightened concerns about regional and even global food security. At the same time, the disruption of agri-food deliveries by Ukraine to international markets lead to a rise in international

prices of these products. This trends created new opportunities for Moldovan agrifood exporters, that have had good harvest in 2021 and could benefit from high international prices. During the last 5 years, on average about 43% of Moldovan gross exports represented agrifood products. Moldova export mainly insulated, sunflower seeds, wines, maize, apples, sunflower seeds oils, car seats etc. (Annex 1). Although, agrifood products represents the commodities that contributes most to Moldovan exports change.

Table 1. Share of agrifood products in the Moldovan merchandise exports

	2011	2015	2016	2017	2018	2019	2020	2021	2022
Gross exports, mil. USD	2216.8	1966.8	2044.5	2425.0	2706.2	2779.2	2467.1	3144.5	4332.1
Exports growth, %, yoy	43.8	-15.9	4.0	18.6	11.6	2.7	-11.2	27.5	37.8
Share of agrifood products in gross exports, %	41.2	46.1	45.3	45.6	42.1	42.7	42.1	44.5	43.5
Degree of influence of agrifood products to changes in exports value, p.p.	12.0	-10.1	1.3	11.6	2.2	3.1	-9.5	23.3	31.7

Source: National Bureau of Statistics data

In 2022, exports of agrifood products contributed to merchandise exports growth by 31,7%, especially due to fats, oil, sunflower seeds, cereals and fruits deliveries to external markets. Re-exports of fuels also have boosted exports significantly. But the industrial production decreased in 2022 along with a marked contraction in investment activity.

SITC	Exports growth , %, yoy	
33	Fuels	17.35
42	Fats and oils	8.11
22	Sunflower seeds	4.30
04	Cereals	1.57
05	Fruits and vegetables	1.43
78	Vehicles	1.09
66	Non-Metallic Mineral Manufactures	0.87
08	Feeding Stuff For Animals	0.75
84	Articles Of Apparel	0.72
35	Electric Current	0.70

Figure 4. Commodity exports growth and top 10 commodity groups that contributed most to Moldova’s exports growth in 2022 compared to 2021, %

Source: National Bureau of Statistics data

The 2022 crisis changed slightly the merchandise exports structure but didn't made it more value-added intensive. The technological intensity of Moldovan exports decreased in 2022, especially the share of medium tech products dropped compared to 2019 year. Thus high, medium and low intensive products decreased by 10 p.p. in the merchandise exports structure in 2022 comparative to 2019 year.

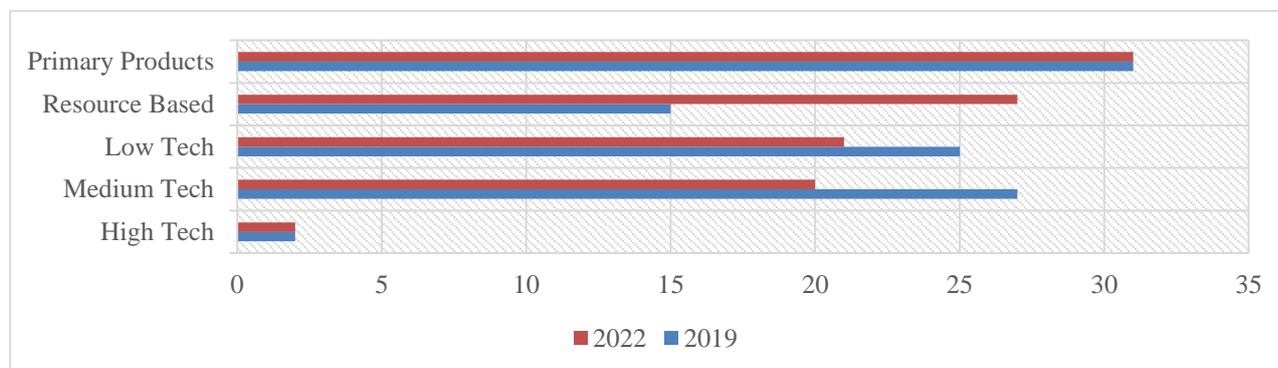


Figure 5. Technological intensity of Moldovan exports in 2019 and 2022, %

Source: World Bank data

Infrastructure is an important factor in supporting private business investment, innovation and productivity; it fosters and lowers the costs of people mobility, goods and services within and between economies. According to the Global Economic Forum the road infrastructure is a basic factor of competitiveness in developing countries, while the recent crisis also emphasized the role of technological infrastructure to increase resilience of economies and international competitiveness. The Logistic Performance Index that is based on a worldwide survey of international logistics operators providing feedback on the logistics “friendliness” of the countries with which they trade rank Moldova the 97-th among 139 countries. Infrastructure and customs administration are the pillars that drag the country down most in the international ranking while the discrepancy in the acquired score comparative to countries in the Central Europe is huge.

Table 2. Republic Moldova in the Logistic Performance Index 2023

Economy	LPI	Customs	Infrastructure	International Shipments	Logistics Competence and Quality	Timeliness	Tracking and Tracing
Estonia	3.6	3.2	3.5	3.4	3.7	4.1	3.8
Latvia	3.5	3.3	3.3	3.2	3.7	4.0	3.6
Lithuania	3.4	3.2	3.5	3.4	3.6	3.6	3.1
Bulgaria	3.2	3.1	3.1	3.0	3.3	3.5	3.3
Romania	3.2	2.7	2.9	3.4	3.3	3.6	3.5
Belarus	2.7	2.6	2.7	2.6	2.6	3.1	2.6
Georgia	2.7	2.6	2.3	2.7	2.6	3.1	2.8
Ukraine	2.7	2.4	2.4	2.8	2.6	3.1	2.6
Armenia	2.5	2.5	2.6	2.2	2.6	2.7	2.3
Moldova	2.5	1.9	1.9	2.7	2.8	3.0	2.8

Source: World Bank data

A 2019 World Bank study concluded that the share of companies that consider transport a major barrier to do business in Moldova (14.7%) is higher than the average for European and Central Asian countries (12.6%). In regional profile, but also depending on their size, there are large gaps in the vulnerability of different enterprises to the existing transport infrastructure. Especially enterprises with more than 100 employees consider transport a critical constraint, compared to 14.7% in Europe and Central Asia.

The Republic of Moldova has a public road network with a length of 9488 km, railway lines in general use - 1151 km, a functioning international airport, two inland waterways of international importance category E, a port offering direct access to international waterways and the Black Sea - Giurgiulesti port. The port is a river-sea port located at the confluence of the Danube and Prut rivers, which provided Moldova with its only commercial access to international waters (Bennett V., 2022). In 2022, over 99,7% of merchandise transportation were made by land. Road transport is also the most commonly used means of international shipping with a share of about 77.1% of total exports in 2022 that dropped from 90% in 2020. Because of the Russia-Ukraine war, transshipments through Giurgiulesti port increased in 2022 (GIP, 2023).

Although it's the main mean of merchandise and persons' transportation in the Republic of Moldova, the quality of road transport infrastructure remains unsatisfactory. In 2020 about 46.8% of national public roads were of poor or very poor quality and 23% in a mediocre state. Correspondingly, less than 30% of roads are in good or very good condition. According to the World Population Review Moldova ranks among the world countries with the poorest road infrastructure, with a 2.6 score of the Road Quality Index at a distance of 2p.p. from Baltic countries.

Table 3. Road Quality Index 2023

Country	Road Quality Index	Mean Speed Score
Lithuania	4.8	89
Estonia	4.7	88
Georgia	3.8	64
Latvia	3.6	77
Armenia	3.6	57
Bulgaria	3.4	88
Ukraine	3	75
Romania	3	73
Moldova	2.6	67

Source: World Population Review

Moldovan authorities have been implementing many policy documents in order to build a solid public infrastructure that would contribute to increasing the inclusion and of the population and the country's competitiveness. This objective is in line with the National Development Strategy European Moldova 2030. Decision makers have focused their attention particularly on quality of roads, and more recently on the ICT infrastructure. An appropriate regulatory, institutional framework and infrastructure in the ICT area were necessary for companies to cope with the world and regional economic changes and to take advantage of the existing opportunities to become more competitive in the world market. Also it is a must to foster populations social and economic inclusiveness.

Over the last few years, the Republic of Moldova has been recording positive trends in improving telecommunications infrastructure, recording an increase in the score for telecommunications infrastructure from 0.19332 in the E-Government Index (EGDI) 2010 to 0.57600 in EGDI 2022. This allowed Moldova to move into the group of countries with advanced ICT infrastructure. But, from the perspective of its competitive capacity in the regional profile, Moldova's score in terms of quality of telecommunication infrastructure is below the average in Europe (0.8392) and even below the average in Eastern Europe (0.7825) and is significantly lower compared to the other components of the index: Online Services Index (0.7380) and Human Capital Index (0.8613) (UN E-Government Knowledge Database 2022).

Regardless of the geographical location of entrepreneurs, including those operating in the Chisinau municipality and the Centre, the problem of poor road quality remains current and acute. The survey of entrepreneurs in the Republic of Moldova in the year 2022 revealed the overall negative impact of road quality on business development. They are negatively influenced by both the quality of roads in the region where they live and their condition throughout the country. Thus, about half of the responding enterprises consider the condition of roads in the country to have a major negative or negative impact on their business, versus 19% for whom the impact of this factor is positive.

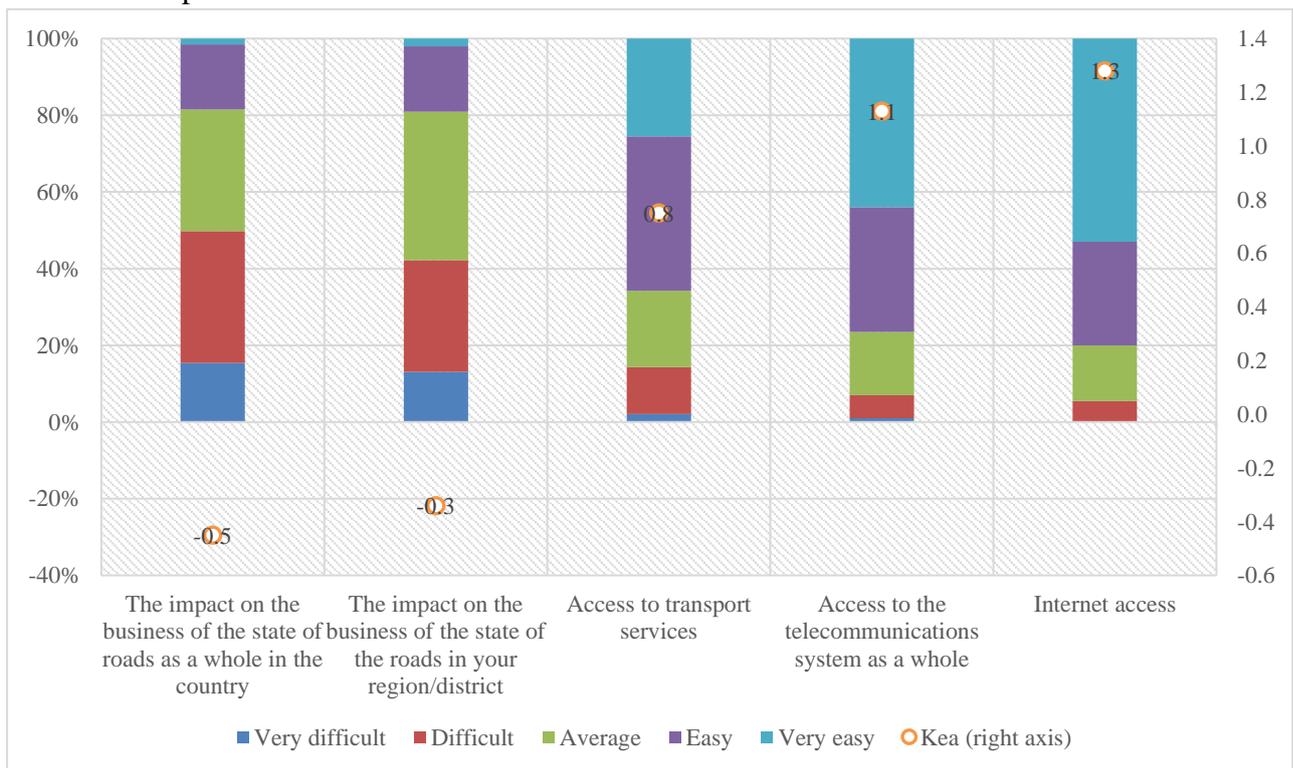


Figure 6. The impact of infrastructure on business development, % of respondents

Source: Results of the research projects 20.80009.0807.38 „Multidimensional assessment and development of the entrepreneurial ecosystem at the national and regional level in order to boost the SME sector in the Republic of Moldova”

Unlike roads, telecommunications infrastructure is the best developed component of physical infrastructure in the Republic of Moldova. About 80% of respondents located in Chisinau and

the Centre region consider access to the telecommunications system either easy or very easy, and in the case of internet access, this share rises to over 80%. In the Northern region and Gagauzia, although 1 out of 2 surveyed entrepreneurs consider access to the telecommunication system either easy or very easy, however for 17% of the respondent enterprises in Gagauzia and 26% in the North of the country access to these infrastructure facilities is difficult, with a higher share considering access to the internet difficult. These findings points to the fact that although the Republic of Moldova has made visible progress in terms of developing telecommunications infrastructure, it is not equally accessible to enterprises from all regions of the country. The further entrepreneurs are located from the Chisinau municipality, the less accessible the telecommunications infrastructures. At the same time, more than half of the surveyed enterprises consider that the telecommunications system has improved (51%), including the access to internet (53.9%). Meanwhile, 1 in 10 respondents believe that the situation in the given area has worsened, and 7 in 10 that the state of things has not changed since 2019.

Enterprises operating within Transport and Hotels, Restaurants and Cafes sectors were the most affected by infrastructure quality in 2022. Almost 35% of respondents working in the given areas consider access to physical infrastructure very difficult or difficult. These are followed by the processing industry where about 1/3 of respondents consider infrastructure as a factor influencing negatively or very negatively their business - an important constraint in the process of diversification and industrialization of the national economy, which relies heavily on agriculture. Given the economic crisis in Moldovan in 2022 and the difficult times enterprises should pass through since the outbreak of the Covid-19 pandemic, public authorities and entrepreneurs' associations have intensified their efforts to support entrepreneurs in the country with various services to strengthen their resilience. There have been launched many programs to support enterprises to implement digital technologies, to support internationalization of business by making them more competitive as well as other services to strengthen them during difficult times taking in account their main challenges etc. In spite of this, 34.9% of respondents perceived access to various support services to overcome crises and deal with business insolvency as very difficult, and another 33.7% -difficult, thus accounting for 2/3 of the surveyed enterprises. About a quarter of respondents perceive yet access to services regarding the implementation of digital technologies difficult or very difficult. In the opinion of 43% of the entrepreneurs surveyed in 2021 the situation has improved compared to 2019, versus 8.5% who considers that things have worsened in the given field.

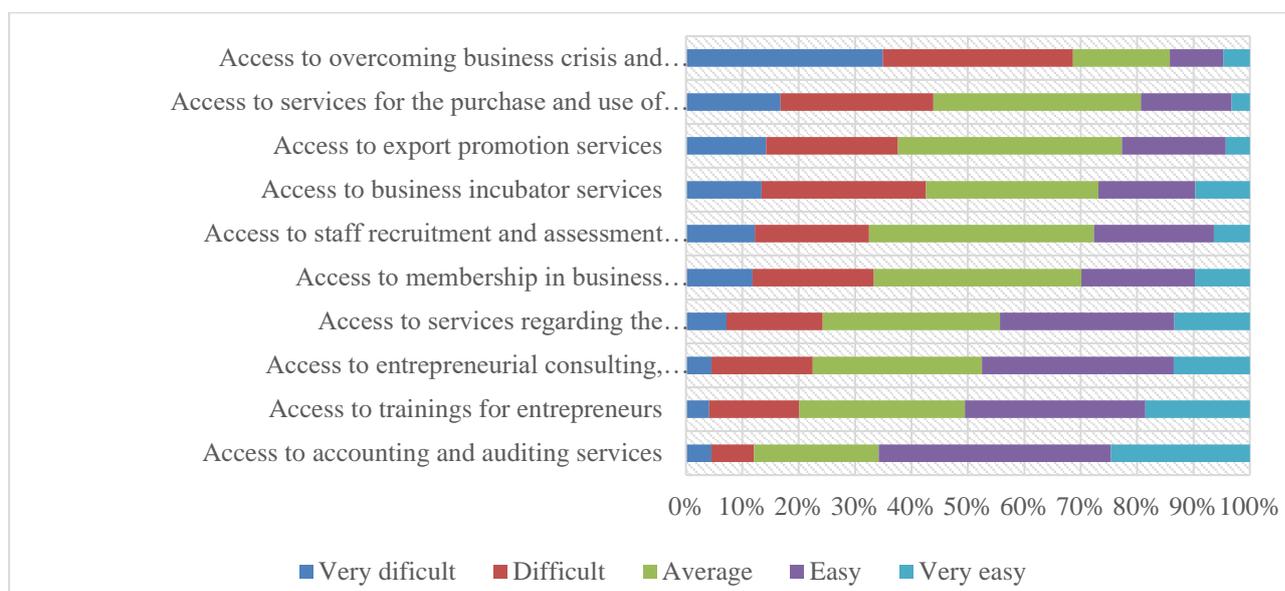


Figure 7. Access of enterprises to business support services, % of respondents

Source: Results of the research projects 20.80009.0807.38 „Multidimensional assessment and development of the entrepreneurial ecosystem at the national and regional level in order to boost the SME sector in the Republic of Moldova”

Despite Government sustained efforts, many business support services were rated with a negative Entrepreneurial Ecosystem Coefficient: access to innovation procurement and utilization services (Kea=-0.4), access to export promotion services (Kea=-0.3), access to business incubator services (Kea=-0.2), access to staff recruitment and assessment services (Kea=-0.1), access to membership in business associations and clusters (Kea=-0.1), that means that most enterprises consider difficult or very difficult to access these services. With the exception of services to overcome crisis and deal with insolvency, to support staff recruitment and training the share of enterprises that felt an improvement in accessing different support services for business in 2021 compared to 2019 was higher than of those who reported a worsening situation. But, further efforts are needed to support the association of entrepreneurs in order to strengthen joint efforts in business development, to stimulate the innovative activity of entrepreneurs and the internationalization of their businesses.

Conclusions and recommendations

After the Covid-19 economic crisis, despite the outbreak of the Russo-Ukrainian war at the eastern border, Republic of Moldova recorded an impressive growth of exports that have led to a slight increase in the world market share, that is very tiny compared to countries in Central and East Europe. At the same time, these trends were supported mainly by occasional rather than sustainable factors. So the fast increase in exports during the 2021-2022 years does not result from qualitative changes in external trade.

Many programs and public services have been offered to enterprises to overcome the crisis, to strengthen their resilience and international competitiveness. Besides sustained efforts have been

made to improve the road and ICT infrastructure that are among the basic factors to increase international competitiveness.

Regardless of the entrepreneurs' geographic location, including those operating in -Chisinau, the problem of low road quality is a critical issue. According to the 2022 enterprise survey data the share of respondents who believe that the quality of roads has worsened far exceeds the share of those who perceived a positive change in this regard. The negative perception persists despite the many projects implemented in the field of road construction and rehabilitation.

On the other hand, the ICT infrastructure has pass through significant improvements that is confirmed by the country's good position in the EGDI 2022 Index and the opinion of entrepreneurs. Over 50% of e interviewed enterprises considers that access to the telecommunications system has improved, including access to the Internet and only an extremely small percentage believes that the situation has worsened. But, telecommunications infrastructure is still less accessible to the business outside Chisinau and the Central region. At the same time, about a quarter of respondents perceive access to services designed to support the implementation of digital technologies difficult or very difficult, despite in the opinion of 43% of the entrepreneurs surveyed in 2021 the situation has improved compared to 2019, versus 8.5% who considers that things have worsened in the given field.

Despite the support provided by the public authorities for increasing the resilience of businesses in times of crisis, 1 out of 3 respondents perceived access to various support services in order to overcome crises and deal with business insolvency as very difficult, and another 1/3 difficult. Many business support services like access to services for the purchase and use of innovations, access to export promotion services, access to business incubator services, access to staff recruitment and assessment services, access to membership in business associations and clusters were evaluated with a negative Entrepreneurial Ecosystem Coefficient.

Further improving of the public infrastructure is a must in order to increase the resilience of businesses and its international competitiveness. Also it is very important to monitor and evaluate the impact of policies promoted in the recent years by the decision makers in order to increase the resilience of businesses to crises and adjust them to the critical needs of businesses, ensuring a wide and non-discriminatory access of entrepreneurs to different business support services.

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**ANNUAL INTERNATIONAL SCIENTIFIC CONFERENCE “COMPETITIVENESS AND
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September 22nd-23th, 2023, Chisinau, Republic of Moldova

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Annex 1.

2019			2022		
8544	Insulated	18.7	2710	Petroleum oils	12.9
1206	Sunflower seeds	7.7	8544	Insulated	11.0
2204	Wine of fresh grapes	5.0	1512	Sunflower-seed oil	8.5
1005	Maize (corn).	4.5	1005	Maize (corn).	7.8
9401	Seats	4.2	1206	Sunflower seeds	7.8
1001	Wheat and meslin.	3.5	2204	Wine of fresh grapes	2.9
3004	Medicaments	3.5	9401	Seats	2.5
0802	Other nuts, fresh or dried	3.3	0808	Apples, pears and quinces, fresh.	2.1
1512	Sunflower-seed oil	2.4	7010	Carboys, bottles, flasks, jars, pot	2.0
0808	Apples, pears and quinces, fresh.	1.9	8703	Motor cars and other motor vehicles	1.7
6204	Women's or girls' suits, ensembles,	1.9	2009	Fruit juices (including grape must)	1.6
2009	Fruit juices (including grape must)	1.7	1001	Wheat and meslin.	1.3
2208	Undenatured ethyl alcohol of an alc	1.6	0802	Other nuts, fresh or dried	1.2
7010	Carboys, bottles, flasks, jars, pot	1.4	2207	Undenatured ethyl alcohol of an alc	1.0
3923	Articles for the conveyance or pack	1.3	3004	Medicaments	1.0
1205	Rape or colza seeds, whether or not	1.2	1205	Rape or colza seeds, whether or not	1.0
6203	Men's or boys' suits, ensembles, ja	1.2	2306	Oil-cake and other solid residues	1.0
0806	Grapes, fresh or dried.	1.1	0806	Grapes, fresh or dried.	1.0
6110	Jerseys, pullovers, cardigans, wais	0.9	2208	Undenatured ethyl alcohol of an alc	1.0
6109	T-shirts, singlets and other vests,	0.9	6204	Women's or girls' suits, ensembles	0.9