

Final scientific review of the project

Project title: Towards the Post-pandemic Recovery: Economic, Political and Legal Framework for Preservation of Latvia's Growth Potential and Increasing Competitiveness (reCOVery-LV)

Summary: The spread of *Covid-19* requires immediate policy response and future-oriented actions to reduce devastating socio-economic impact of crisis and preserve growth. The concept of the reCOVery-LV builds on a multidisciplinary assessment of the vulnerability and resilience of Latvian economy to the external shocks.

In the global political landscape with protectionism elements and COVID-19 affected global supply chains, the space of manoeuvre for a small open economy like Latvia, is limited. Self-sufficiency is possible only in a few sectors. We analysed, for instance, how to improve the resilience of food producers and food supply chains during the crisis thus strengthening Latvia's food self-sufficiency. However, sustainable solutions relate to international competitiveness and increased participation in the global and less risky regional supply chains.

Over a longer term, the key factor of competitiveness is a productivity renaissance. The research findings and policy recommendations build a comprehensive "Latvian Productivity Report-2020" presented to and approved by the stakeholders, Ministry of Economics and the European Commission.

As public resources within fiscal sustainability constraints should be invested effectively, the research team elaborated on the state aid criteria promoting productivity growth and efficiency of the infrastructure projects.

The research team has worked out "trend" and "accelerated growth" scenarios. The underlying assumptions provide that it is crucial for Latvia to invest in economic stabilisation in the short term and in economic transformation in the medium and long term. Investment in new technologies, wider use of digital solutions, e-commerce, telework, new climate initiatives (including less paper use), and development of innovation ecosystem will have a significant impact on productivity, competitiveness and faster growth.

Accelerated growth scenario require the institutional sustainability and effectiveness of the Government of Latvia. Therefore, the research team has elaborated on constitutional and administrative framework for effective management of external shocks. Intensive use of videoconferences and remote sittings of the Parliament during the pandemic provided a background for implementing a universal e-platform for the government communication in post-pandemic period, substituting in-person visits and elaborated a roadmap for implementing an e-platform.

Deliverables: 7 reports submitted to the Government, 1 - to the Baltic Assembly, 39 papers published/accepted for publications, 63 presentations at research conferences, reviewed monograph submitted for publishing.

Kopsavilkums: COVID-19 izplatības apstākļos ir nepieciešama tūlītēja, uz nākotni vērsta rīcība, lai mazinātu krīzes postošo ekonomisko un sociālo ietekmi un veicinātu ilgtspējīgu izaugsmi. Projekta reCOVery-LV koncepts balstās uz starpdisciplināru Latvijas ekonomikas ievainojamības un noturības pret ārējiem satricinājumiem novērtējumu. Globālajā politiskajā kontekstā ar pastāvošajiem protekcionisma elementiem un COVID-19 negatīvi ietekmētajām globālajām piegādes kēdēm Latvijas mazai atvērtai ekonomikai manevrēšanas iespējas ir ierobežotas. Pašpietiekamība ir iespējama tikai dažās nozarēs. Projektā, piemēram, tiek analizēts, kādā veidā krīzes laikā varētu uzlabot pārtikas ražotāju un piegādes kēžu noturību, vienlaikus stiprinot Latvijas pārtikas pašpietiekamību. Tomēr ilgtspējīgi risinājumi ir saistīti ar starptautiskās konkurenčspējas veicināšanu un piedalīšanos globālajās piegādes kēdēs, nēmot vērā, ka lielāku drošību nodrošina reģionālās piegāžu kēdes. Ilgtermiņā galvenais konkurenčspēju veicinošs faktors ir produktivitāte. Produktivitātes izpētes secinājumi un politikas ieteikumi veido visaptverošu "Latvijas produktivitātes ziņojumu 2020", kuru atzinīgi novērtēja partneri, Ekonomikas ministrija un Eiropas Komisijai.

Tā kā publiskie resursi fiskālās ilgtspējas ierobežojumu ietvaros būtu jāiegulda efektīvi, pētnieku grupa izstrādāja valsts atbalsta kritērijus, kas veicinātu uzņēmumu produktivitāti un infrastruktūras efektivitāti.

Tika izstrādāti ekonomikas attīstības "trenda" un "paātrinātas izaugsmes" scenāriji. Scenāriji paredz, ka Latvijai ir ārkārtīgi svarīgi ieguldīt līdzekļus ekonomikas stabilizācijā īstermiņā un ekonomikas pārstrukturizēšanā vidējā un ilgtermiņā. Ieguldījumi jaunās tehnoloģijās, plašāka digitālo risinājumu izmantošana, e-komercija, attālinātais darbs, jaunas klimata pārmaiņu samazināšanas iniciatīvas (tostarp mazāka papīra izmantošana) un inovāciju ekosistēmas attīstība būtiski ietekmēs produktivitāti, konkurenčspēju un straujāku izaugsmi.

Paātrinātas izaugsmes scenārija īstenošanai ir būtiska Latvijas valdības institucionālā ilgtspēja. Pētnieku grupa izstrādāja ieteikumus konstitucionālo un administratīvo tiesu sistēmas pielāgošanai ārēju satricinājumu pārvaldībai. Videokonferenču un attālināto Saeimas sēžu izmantošana pandēmijas laikā nodrošināja pamatu universālas e-platformas ieviešanai valdības iestāžu saziņai pēc pandēmijas, aizstājot vizītes klātienē.

Rezultāti: 7 ziņojumi iesniegti valdībai, 1 - Baltijas Asamblejai, 39 raksti publicēti/pieņemti publicēšanai, 63 prezentācijas zinātniskās konferencēs, recenzētas monogrāfijas manuskripts iesniegts publicēšanai.

1. Scientific excellence

The reCOVery-LV is an academic multidisciplinary applied study that aims at developing comprehensive analysis and policy recommendations on reducing pandemic crisis economic consequences and fostering economic recovery. Annex 1 presents a detailed description of the project's objectives, vertical and cross-cutting tasks.

Concept of the project builds on the assumption that public support of innovations, digital transformation and technological development has a strong impact on productivity, competitiveness and future growth. In a situation, where the transmission of pandemic viruses, such as *Covid-19*, has set a new scene, investing in productivity and social cohesion is a key policy response.

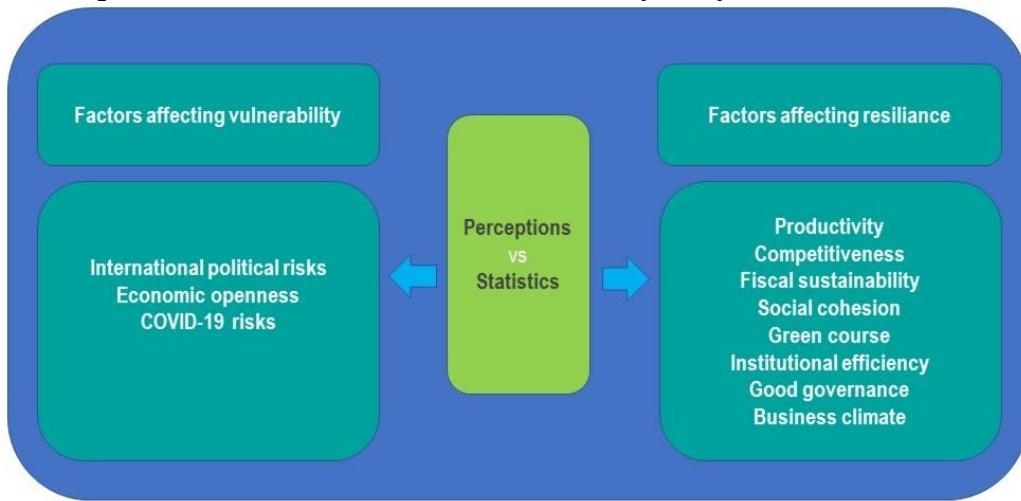
Following the State President E. Levits initiation to extend research to the *national sustainability concept*, the overarching task of the project includes: (1) elaborating on a theoretical framework of the long-term institutional and economic sustainability¹; (2) analysing economic vulnerability² and resilience to external shocks.

The theoretical framework of national sustainability assessment includes analysis of the country's international competitiveness, institutional changes and innovation ecosystem. The national sustainability interconnections with key elements, principles of institutional change and innovation ecosystem assessment are shown in Annex 2.

The central element of *reCOVery-LV* is *economic sustainability assessment* (Figure 1). This assessment has four essential components: (1) the empirical analysis of exogenous risks, vulnerability and resilience; (2) the survey-based analysis of people's attitude towards the government's emergency programs including trust in the state, solidarity between people, tax discipline, etc.(results of public opinion survey are summarised in Annex 3), (3) the comparison of statistically justified findings with the public perception and (4) conclusions on the future sustainability scenarios and policies.

The conceptual framework for the vulnerability and resilience of Latvian economy to the external shocks (including pandemics) is based on the UN approach to economic risk assessment in small countries³ with high economic openness.

Fig. 1. The conceptual framework for economic sustainability analysis



Small countries are naturally vulnerable to external economic shocks, however, they can be very successful: in 2019, six of the world's ten most competitive economies were small countries⁴, including Singapore and Hong Kong with competitiveness rank 1 and 3, the Netherlands ranked 4, and Sweden and Denmark at the 8th and 10th place. In addition, small countries can increase their resilience to external economic shocks by deliberately developing efficient economic institutions that are able to absorb the effects of these shocks on the economy.

¹Economic sustainability – the ability of the economy to withstand or recover rapidly from external economic shocks associated with the risk-mitigation solutions deliberately developed by market participants and governments.

² Economic vulnerability – the sensitivity of economy to external shocks stemming factors beyond government control, e.g., from economic openness, high export concentration, import dependence.

³Briguglio et al., (2008) "Economic Vulnerability and Resilience: Concepts and Measurements," Research Paper no. 2008/55 (United Nations University, World Institute for Development Economic Research).

⁴ World Economic Forum (2019), Global Competitiveness Report 2019, xiii.

The joint research conducted in the framework of *reCOVery-LV* with Estonian and Lithuanian partners “*A comparative review of socio-economic implications of the coronavirus pandemic in the Baltic States*”⁵ provides a comparative picture of the effects of the crisis and describes key factors and uncertainties affecting the recovery. Timely government actions, business resilience, and social response are crucial in overcoming the crisis. The research team concludes that due to the global scale of the crisis, the joint coordinated efforts are at the heart of solutions. Enhanced cooperation is crucial in the Baltic region with highly interconnected economies and societies. The research presents possible coordinated policy actions to support speedier recovery, invest in long term technological progress and reduce vulnerability to exogenous political risks.

International political risks will affect the Baltic region and Latvia’s economic recovery in the post-pandemic period. Using literature analysis and process-tracing methodology, the research team has identified four potential scenarios (Annex 4): (1) *Status quo*; (2) Increased solidarity and multilateralism; (3) Neo-sovereignism and protectionism; (4) Cohabitation+. Cohabitation+ is the most likely scenario in a “post-COVID-19 world”. In such a scenario the US will continue efforts to adjust its position to restore the influence of its major corporations. Most likely, the US will not entirely return to pre-Trump liberal era and *protectionist elements* in its policy will remain. The EU will seek for global leadership, advancing its role as a pioneer in addressing climate change and an advocate of Sustainable Development goals. At the same time, the EU will remain lightly reserved to partnerships that do not follow its values of human rights and social and environmental responsibility. China will seek to preserve its economic partnerships with the Western countries while antagonizing them on security matters. The Russian Federation will seek to stay relevant in a world where demand for raw materials is changing, and it will continue to punch above its weight with a complex use of political, economic and military means.

Latvia will thus find itself in the world that is becoming more complex and uncertain. The rule-based world order will no longer be perceived as given and multilateralism in world politics may not be the preferred approach of all countries in the world. In such a scenario, strong EU and NATO will continue to be Latvia’s major security guarantees, providing Latvia with international protection, geopolitical allegiance, means to continue growth, and importantly – access to financial resources and technologies.

In the global environment, with protectionist elements and distorted supply chains during COVID-19 crisis, the space of manoeuvre for a small open economy like Latvia, is very limited. The research team focussed on locally appropriate solutions adapted to post-crisis conditions, that would improve *the resilience of Latvia’s producers, as well as food and food ingredient supply chains while also strengthening Latvia’s food self-sufficiency* and allowing enterprises to prepare for a possible sudden restructuring of food systems during and after the crisis. The methodology and key findings of this sub-project are summarised in Annex 5.

While strengthening self-sufficiency in some (rather few) sectors is important, the *sustainable future solutions are not related to the country’s economic isolation and should be linked to increasing international competitiveness and switching from global to regional supply chains when possible*.

Covid-19-related economic risks remain high, especially in the short term. Some sectors, firms, and workers have suffered lasting damage, in particular in transport, trade, tourism, healthcare, education and logistics. Recent acceleration of vaccination in Latvia provides some confidence that day to day life will return to something closer to normal before autumn 2021. In the meantime, government support will be needed to compensate or at least reduce the economic damage.

Over a longer term, the most important factor of international competitiveness and growth is a productivity renaissance. An accelerated programme of investment in technology and capital, coupled with complementary investments in human capital and innovation, could raise rather sharp labour productivity growth. This investment in intangibles as well as physical capital will be supported by very low borrowing rates. To lift aggregate productivity growth, these investments in capital, technology, and knowledge will need to be made in sectors across the economy. It cannot rely simply on technology sectors, but needs to be a broad-based transformation from industry to services and beyond.

Based on these assumptions, the research team argues that productivity is a key of economic resilience and future growth. The comprehensive productivity analysis and main findings build a “*Latvian Productivity Report-2020*” (key findings of this report are summarised in Annex 6).

⁵ https://www.riigikogu.ee/wpcms/wp-content/uploads/2020/11/Baltic-Assembly_final_02.11.2020.pdf

The literature review including Latvia's productivity study (Šteinbuka, 2019⁶), the OECD⁷, the IMF⁸, the European Commission⁹, the WEF¹⁰, etc. shows:

(1) The Latvia's productivity gap compared with developed countries remains large. Productivity levels in almost all sectors are about a third of the EU-15 average. (2) Productivity growth has slowed down after 2008, as the financial crisis impaired the credit channel impeding stronger capital deepening and investment in innovation. (3) Closing productivity gaps will require continued progress on structural reforms and state support during the pandemic crisis. (4) Increasing productivity and competitiveness requires a comprehensive and broader approach: strong performance in one area cannot compensate for poor performance in another. Productivity dynamics are influenced by several factors, the identification and research of which is important for researchers, entrepreneurs, and policy makers. Without an understanding of the factors that determine productivity dynamics, it is not possible to apply appropriate policy instruments to ensure sustainable economic growth. (5) Productivity growth will have to increasingly rely on knowledge-intensive activities. Latvia's weakest point has been innovation, which requires investment in research and development, in developing people's knowledge and skills, and in other intangible assets. However, policy makers must not forget the "old" problems, such as infrastructure gaps, regional and social inequalities, etc. (6) Latvia's low level of productivity is determined by the relatively weak participation of producers in global value chains and the specialization of exporting companies in low-tech production. Therefore, the opportunities to increase the level of productivity of Latvian companies are mainly related to their ability to perform technological modernization and innovation, to expand participation in world, but preferably in regional (less risky) value chains.

Overall productivity dynamics in Latvia shows that since 1996, productivity has increased almost 3 times. The global financial crisis has strongly affected economic activity and productivity. Positive productivity dynamics have resumed since 2010, and in the last nine years (2011–2019) productivity has increased on average by 2.6% annually, i.e. 2.5 times slower than before global financial crisis (1998-2007). In 2019, the productivity level in Latvia was 49.8% (68.8% after PPS) of the EU average, which is one of the lowest indicators in the EU. This can be explained by low total factor productivity, and significant differences in the quality of production resources (human and capital).

In 2020, the Covid-19 pandemic has had a strong and lasting global impact on the socio-economic situation. Like elsewhere, the economy in Latvia has entered a recession. The negative impact on labour market is obvious but the impact on productivity is unclear. The temporary closure of enterprises, the increase in teleworking and the introduction of social distancing affect data collection. Government support measures, such as downtime benefits, affect the recording of labour productivity (output per number of employees), as a person may not work (be idle), but statistics perceive it as a worker. In this case, the productivity measured as output per hour worked seems a more appropriate measure of the efficiency at corporate level. However, the use of this indicator is also not ideal because of several uncertainties regarding the use of short-time work schemes.

In terms of the number of hours worked, in the second quarter of 2020, which was the worst quarter affected by the Covid-19 crisis so far, productivity in Latvia increased, but in terms of the number of employees, it decreased. The analysis shows that market sectors with relatively higher productivity levels are not more resilient to the Covid-19 pandemic shock than other sectors.

The low level of productivity in the economy is largely determined by the *extremely low productivity in the manufacturing*. In 2019, productivity in Latvia's manufacturing industry was almost 38% (52% after PPS) of the EU average. It is largely determined by structural factors. The structure of Latvia's manufacturing industry is strongly dominated by low-tech industries, which in recent years accounts for more than half of the total value added of the manufacturing industry, which is almost one and a half times more than the EU average.

The transition from old to newer technologies contributes to productivity growth at the company and industry level. However, the effectiveness of such changes in raising overall productivity levels depends to a large extent on the *redistribution of resources from the lowest to the highest productivity sectors, as well as on sectors with faster productivity dynamics*. To determine the impact of the redistribution of labour resources on the overall

⁶ https://www.apgads.lu.lv/fileadmin/user_upload/lu_portal/apgads/PDF/Monografijas/Produktivitates_celsana/Produktivitate.pdf

⁷ <https://doi.org/10.1787/f8c2f493-en>

⁸ <https://www.imf.org/en/Publications/CR/Issues/2016/12/31/Republic-of-Latvia-2016-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-43983>

⁹ https://ec.europa.eu/info/sites/info/files/file_import/2019-european-semester-country-report-latvia_lv.pdf

¹⁰ http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

productivity dynamics in Latvia, the shift share analysis method¹¹ was used. The analysis shows that employment is growing in sectors with above-average productivity levels, such as the manufacture of computer and electronic equipment, while employment in some low-productivity sectors, such as light industry, is declining. However, many jobs are still being created in sectors with relatively low productivity levels, such as accommodation and food service. The redistribution of labour resources in favour of more productive sectors is insufficient.

Key factor of boosting productivity is increasing production of goods with the higher added value. Participation in global or regional value chains enables companies to "climb" up the ladder of the production chain. Involvement in global value chains contributes to export growth and FDI. Statistical data show that foreign trade in Latvia is relatively low. In 2019, foreign trade was 60% of GDP in Latvia, 73% in Estonia and 77.5% in Lithuania. In addition, Latvia has a much lower share of high-tech products in exports than the most developed EU countries. In 2017, only 10% of Latvia's exports were attributable to high-tech products (the EU average was 18%). According to the Atlas of Economic Complexity study¹², in 2018 Latvia ranked 34th out of 124 countries in the world in terms of economic complexity of exports. As during pandemic crisis, the situation is getting worse, the government should facilitate the involvement of companies, especially SMEs, in global or, preferably, regional value chains by the direct support and better business environment. For engaging in knowledge-intensive global value chains, the Latvian companies need strong skills, high innovation capacity and efficient use of resources.

Making *full use of digital opportunities* is essential to maintain productivity and improve living standards. In Latvia, the fixed broadband coverage of households still lags the EU average, and a digital divide has developed between urban and rural areas. Half of the Latvian population lacks basic digital skills that prevent them from using the Internet effectively. The integration of digital technologies in companies is well below the EU average. Latvia has not developed a comprehensive strategy for the digitization of companies. The lack of highly qualified staff exacerbates this problem, and adequate and speedy actions are vitally important.

Digital processes have a significant impact on the labour market. In a number of sectors further global digitalisation and manufacturing automation can also mean irreversible job losses, and actual employment could depend on the extent to which the opportunities of global digitalisation are used to create new products and to produce them on the market. All these processes can significantly change the skills' profile of workers on the market, and employees will have to be able to adapt properly by learning and applying new digital knowledge and skills.

In Latvia, well developed internet infrastructure and advanced digitalisation of public administration facilitated the transition to remote work. The positive impact of remote work on productivity has not been proved yet. In the long run, the wider use of telework can have a significant impact on the structural transformation. Telework can reduce the negative impact of economic activities on the environment and decrease regional disparities, while also create negative side effects, such as increasing inequality. Key findings of the sub-project "*Assessment of the impact of remote work on long-term productivity and preparation of proposals for increasing productivity in remote working conditions*" (*additional task of the Ministry of Economy*) are summarised in Annex 7.

The outcome of the macroeconomic resilience assessments has been justified also by a *profound evaluation of Latvian enterprises crisis-resilience and solutions for its improving* (Annex 8). The detailed assessment of crisis-resilience includes (1) analysis of the companies' financial and economic robustness, (2) evaluation of Latvian companies' innovation potential in overcoming crisis (enterprise-based total factor productivity), and (3) research on the challenges of overcoming the COVID-19 negative impact on the Latvian enterprises.

Implementation of the lockdowns in order to prevent virus spread did not affect all economic sectors equally. Modern economics, when so many processes do not require human presence, navigate through the crisis not in a homogeneous way, and the dogma about the survival of the strongest is no longer true. There are weak companies surviving in such resilient sectors as e-commerce, while in the sectors, where the demand has reduced to virtually non-existent mode, even the strongest face major obstacles to keep solvency position.

Based on the data of Firms.lv, the research team has built a database for 150000 companies with the turnover exceeding 145 000 EUR since 2007, in order to judge dynamics of the enterprises' financial health.

It was concluded that difference in quality of financial conditions is well-seen among the industries: IT, medical and professional services demonstrated highest profitability ratios and strongest position, while the companies operating in trade, in accommodation and food services, as well as in transportation industries struggle the most. The strongest companies are located in Riga, while the weakest ones are located in Vidzeme and Latgale.

¹¹ https://www.mti.gov.sg/-/media/MTI/Legislation/Public-Consultations/2018/A-Shift-Share-Decomposition-Analysis-of-Labour-Productivity-Growth-in-Singapore/ba21_aes2017.pdf

¹² <https://atlas.cid.harvard.edu/countries/132/new-products>

The overall crisis-resilience of an average Latvian enterprise can be determined at the moderate level. Crisis-resilience is determined by rather limited dependence on the borrowed capital, low debt servicing expense relative to the earnings ability and decent efficiency of capital management. On the negative side, cash reserves are quite low. Additionally, the profit margin, which is an indication of the enterprises' competitive advantage and pricing power, is generally on a low level, thus making the companies more vulnerable in case of economic downturn. Operating leverage, being on a high level in Latvian companies, prompts about high fixed cost amount, which can be risky in time of worsening economic conditions or at demand absence during the lockdowns. The most affected are accommodation and food service companies, which are not only characterized by the cyclical nature, but also have poor financial conditions compared to other industries.

Competitiveness of companies depends on *innovations, investing in R&D and intangible capital, to ensure higher company productivity.* The research shows that the significance of the total factor productivity for the Latvian companies is growing, since the role of labour and capital tends to diminish. These factors do not have a considerable impact on the ability of the companies to generate marginal revenue growth. The proportion of intangible investment in the total value of company assets is growing as a response to global economic trends and rapid technological development. That is the reason why the widely used TFP calculation methodology, which includes physical capital, may be reconsidered to give a more objective view of the role of the intangible assets. The research of *the impact of COVID-19 on the Latvian enterprises and business response* was based on the survey, and questionnaire was designed to collect both quantitative and qualitative data. In the end of August, it was sent to Ltd Firmas.lv clients (n=2377), the Latvian Chamber of Commerce and Industry and other associations. The response rate was not very high as only 334 companies shared their experience on the topic.

Despite the atmosphere of the entire shock, distress and anxiety, *some of the companies managed to find new innovative solutions to overcome the crisis and even improve their companies' work efficiency.* The qualitative content analysis of the responses to the question on the opportunities identified and used by the companies with a positive impact on their businesses during COVID-19 revealed three groups of categories related to: a) increase in revenues caused by new product and service introduction, creation of new sales channels and attraction of new clients; b) digitalization of processes owing to new IT solutions, new forms of work organization, introduction of new internal and external communication forms, new forms of document turnover; c) cost savings because of introduction of IT solutions and attracting new specialists at a reasonable price conditioned by increasing their competitive advantages. As a result, increase in work efficiency was observed (see Fig. 2).

There are also other types of new opportunities identified and used by the companies while searching innovative solutions through introduction of new technologies, new opportunities for brand development, e-learning of clients, improvement of the infrastructure, finding new collaboration forms in the company, self-production of raw materials and optimization of the production process.

All the data collected in the survey are being organised in a matrix preparing them for a taxonomic analysis which will be completed and interpreted by the end of the project, as well as be published in scientific papers.

The state support measures¹³ to limit the consequences of the Covid-19 pandemic create insignificant risks to fiscal sustainability. “Latvian Productivity Report-2020” includes research team’s findings on fiscal impact (Annex 6). Covid-19 caused a slowdown in economic activity, which posed the following risks: (i) a sharp decline in corporate liquidity due to restrictions and rapid changes in demand; (ii) a general supply shock due to supply chain disruptions; (iii) a secondary demand shock is evolving gradually as both export demand and internal market capacity decline. In such circumstances, active state intervention with fiscal policy instruments was required. If the stabilization and support measures implemented by the state prove to be ineffective or insufficient, it could also lead to a crisis in the financial sector, bankruptcies and a lack of capital in the banking sector.

¹³ Analysis of Latvia's fiscal response to economic crisis has been based on the data provided by Ministry of Finance, State revenue service, financial institution Altum and publicly available information.

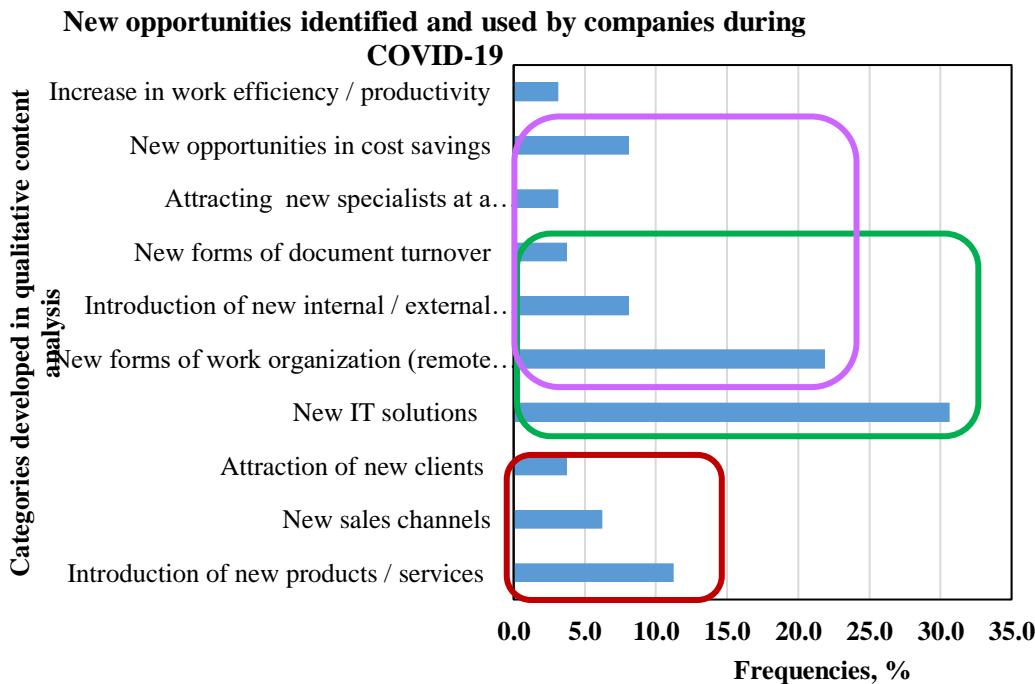


Fig. 2. Distribution of the frequencies of the categories of new opportunities identified and used by companies

The right choice of fiscal instruments is important to achieve the economic recovery as efficiently as possible and with the smallest impact on the public finances. International institutions were unanimous in their actions and recommendations on the choice of fiscal instruments. The general escape clause of the EU's Stability and Growth Pact was activated, allowing the governments to increase budget deficit in 2020 and 2021 to the extent necessary to mitigate the economic damage caused by the *Covid-19* pandemic. The EU state aid rules also made it possible to provide financial support to companies. The lines of action highlighted by the EU included support for the health care system, providing liquidity to affected businesses, and retaining jobs and maintaining incomes. For its part, the ECB announced a 750 billion EUR pandemic emergency asset buy-back program.

The Latvian government continues the tradition of conservative fiscal policy, which was established during the financial crisis and justified itself when Latvia joined the Eurozone. Latvia's support policy during *Covid-19* first wave was the most moderate among the Baltic States¹⁴. Latvia's discretionary measures amounted to 3% of GDP, while in Estonia and Lithuania they amounted to 5.3% and 21.4% of GDP, respectively. Latvia's expenditure on liquidity measures, which mainly consists of loans and guarantees, was 6.8%, close to the EU average, while in Estonia and Lithuania it was 9.2% and 6.6%, respectively. Although care must be taken when comparing and interpreting the scope of the Latvian support program with other countries, the Latvian program looks proportionate, especially taking into account the level of spread of the virus. The best independent evidence of reasonable fiscal stimulus is the maintenance of the relatively high credit rating, and improvement in outlook, for Latvia by the international rating agencies S&P Global and Fitch in these fiscally turbulent times.

The program of Latvian state support, estimated at about 11.1% of GDP by end-2020, has been timely and has reached all segments of the economy. The most disputable issue is the scope of the furlough schema, which did not reach the planned amounts despite several steps taken by the government to relax the criteria for beneficiaries. The reason is to link the intensity of the furlough support with the amount of taxes paid. It is not empirically justified that this principle, which in "normal life" is reasonable and should encourage fair tax payments, works well in extreme circumstances. The academic studies,¹⁵ and also the public opinion survey of reCOVery-LV¹⁶, show that tolerance for tax evasion is high also during crisis, which complicates the country's struggle with the

¹⁴ The report "European Fiscal Monitor, September 2020". Available: <https://www.euifis.eu/download/efm.pdf>, accessed 23/11/20

¹⁵ Sauka, Arnis and Tālis Putniņš (2020), Shadow Economy Index for the Baltic Countries 2009–2019 (SSE Riga).

¹⁶ <https://bit.ly/reCOVery-LVsabiedriskāsdomasaptujasrezultātuapkopojums>

shadow economy. There are signs, however, that Latvia's furlough schema, despite significantly lower amounts as compared with Estonia and Lithuania, has been more effective in terms of reducing unemployment.

As Latvia's public debt level is one of the lowest in the EU and according to the medium-term financial plan will remain well below 60% of GDP, the fiscal sustainability risks are insignificant.

As limited public resources should be invested effectively, the research team elaborated on state aid criteria promoting productivity. The study has been conducted by using micro data from the ORBIS database to analyse the productivity (i.e., real value added per employee) of 167 thousand Latvian companies over 2011-2018 period. As a result, three criteria have been identified to receive a state support for enhancing aggregate productivity.

The research shows that productivity of Latvian companies is positively related to their size, age, as well as location closer to Riga and other Republican cities. For example, in large companies (more than 250 employees) productivity is by half higher than in small companies (11 - 50 employees). In the first years of a company's operation, the level of productivity is usually relatively low, while it is the highest for 10-15 years aged companies. Also, in a company located within a ten-kilometre radius from the centre of Riga, productivity is almost twice higher than in a company located further than hundred kilometres from Riga. However, there is a significant variation in productivity in all the above groups of companies. Multivariate regression results show that industry, location, size, and age explain only 19% of productivity differences between companies. In addition, the distribution of productivity has a positive skewness - for most companies the productivity is lower than the group average. For example, in the group of large companies, three quarters of employees are employed in companies with productivity lower than the average.

Based on these findings, as a part of the "Latvian Productivity Report-2020", three (one main and two additional) criteria have been defined for companies to receive a state support. These criteria were developed to enhancing aggregate productivity; therefore, additional criteria related to short-term changes in the company's financial position (for example, the percentage of decline in turnover) are not considered.

The *first (main) criterion* for state support is that in the medium term the company has been able to achieve higher productivity than other similar companies (in the same size and age group, industry and location or distance from Riga and other Republican cities).

The *second (additional) criterion* is that the company belongs to a group of companies with a higher probability of continuing economic activity. The results of this study show that manufacturing companies are more likely to continue their economic activity, as well as older companies with more than ten employees.

The *third (additional) criterion* is that a significant part of economic activity in the company is carried out in areas with high unemployment rate. It takes into account significant labour market differences between Latvian municipalities and allows prioritizing job retention in areas with the highest unemployment prevalence. Although during the *Covid-19* outbreak, the fastest unemployment rise was observed in large cities, still the highest unemployment rate remains in some Latgale municipalities (where the number of registered unemployed is about 20% of the working age population).

The relative importance of these three criteria can vary depending on the phase of the economic cycle. For example, during the economic crisis, the importance of the third criterion may increase as the relevance of job retention rises. In turn, in the expansion phase of the economic cycle, the weight of the first criterion might be increased.

Not only state support, but also *efficient banking system is critical* in terms of access of the funding by companies and households. In Latvia unlike Estonia, Lithuania as well as Finland and Sweden, bank lending has decreased since 2008 recession and continued decreasing during pandemic first wave. This can be explained by intensive "financial system restructuring" and tough supervision rules introduced to prevent money laundering, which happened just before *Covid-19* pandemic. The research team took note of recent adjustment of supervisory rules to facilitate lending, however, the impact is still unclear. The bank supervisory bodies must work closely with commercial bank managers to identify and prevent hindering factors for loan growth. Making lending landscape stronger is crucial in the *Covid-19* pandemic second wave.

Financing of infrastructure projects is one of the most considerable opportunities and risks in eliminating the *Covid-19* crisis consequences¹⁷. The currently available EU funding provides wide possibilities, and the application process is on a way. It is highly important to identify those infrastructure projects that would contribute to Latvia's economic growth, productivity and competitiveness. Historically, the share of infrastructure projects is dominating among other applications. Most likely, the current period will not be an exception. The research

¹⁷ International Monetary Fund (2020) Regional Economic Outlook. Europe: whatever it takes: Europe's response to COVID-19. Washington, DC: International Monetary Fund, 2020, 45 p. ISBN: 9781513558257

team conducted a comprehensive analysis of the Latvian previous positive and negative practise, the experience of other countries, as well as evaluation of the current opportunities and threats (SWOT). Moreover, the globally recognized need for transition to the green economy and digitalization requires ambitious steps, integrated view on cross-sectoral correlations also in such comparatively conventional field as infrastructure.

The research team concluded that (1) intensifying investments in infrastructure is an important tool to reduce pandemic crisis damage. It could increase the productivity, competitiveness and facilitate transition to the green and digital economy. However, in case of weak project governance the output from the infrastructure investment could be even negative. (2) Latvia's *strength* is full access to electricity, quality of air transportation services, efficiency of rail services, quality and security of energy supply, coverage of mobile network, use of ICT services, ISO 14001 environment certificates. (3) The main *challenges* are related to roads infrastructure quality, high energy price, poverty, water and sanitary requirements, government online services, logistics infrastructure, ICT access, lack of coherence and synergy between different state, municipality and private entities etc.

Based on the survey of the key 14 infrastructure companies of Latvia and the energy infrastructure companies from 23 countries as well as market trends analysis, it was concluded that generally the situation in the infrastructure companies due to their regulated nature is comparatively stable (except traffic-related infrastructure companies); however, some projects are being postponed. 54% of the Latvian companies participating in the survey had applied for the post-Covid recovery funding, and 77% of the companies considered that they could support economy of Latvia, mostly by implementing of infrastructure projects.

As a part of the "Latvian Productivity Report-2020", the research team has developed three groups of *criteria for the infrastructure projects facilitating competitiveness and being important to overcome Covid-19 crisis*. The *first group A* are the productivity criteria, addressing the main challenges of Latvia's infrastructure reflected in international indexes. They give an answer to the principle question – what Latvia aims to achieve by implementing a project (e.g., improve the road transportation quality, rise intensity of infrastructure use, etc.).

The *second group B* are efficiency criteria. Their key task is to facilitate selection of the most efficient and appropriate project to achieve the aim highlighted by the A group of criteria (alternative project evaluation, efficient governance, etc.)¹⁸. The *third group C* reflects the priorities of the available financing, therewith indicating the financing possibilities of a certain initiative (encourage EU economic, social and territory cohesion, strengthen resilience, eliminate a negative impact of *Covid-19*, support green and digital transmission, etc.).

The research team has worked out *economic development scenarios of Latvia*. The underlying assumptions provide that given the impact of *Covid-19*, the rapid development of technology and new climate initiatives, it is wise to invest public money in maintaining economic capacity in the short term and in economic transformation measures in the medium and long term. Currently, ~ 18 billion EUR is provisionally available for Latvia for the next 7-8 years. These resources include the EU multi-annual budget, "Next Generation" and other EU funds, as well as the national budget investments marked in the medium-term planning documents.

The adapted Hermin's medium-term model¹⁹ has been used to assess the after-*Covid* prospects until 2030. Two development scenarios have been worked out - *trend and accelerated growth scenarios* (Annex 9).

In the *trend scenario*, assuming that the current trends continue, GDP growth could reach an average of 3.9% per year in the 2021-2024 period, while in the period 2025-2030 the annual growth rate of the economy will slow down to within 2.5%. In this scenario, the Covid-19 pre-crisis level (2019) is reached in 2022. In turn, the economy will return to the pre-crisis growth trend only in 2027.

In the *acceleration scenario*, which envisages competitive advantages of technological factors, production efficiency, innovation, as well as the ability to adapt and take advantage of global change, economic growth may reach 5.3% annually on average from 2021 to 2024, but in the following years an average of 3.7% annually. Overall, estimates show that the introduction of the latest technologies, the development of new products and services, as well as the wider use of digital solutions and improved process efficiency, have a significant impact on faster growth in industries and the economy as a whole. Productivity contributes the most to growth in both development scenarios. However, solutions to the problem of labour supply are also an important factor in ensuring faster growth. Investment in human capital is very important. Providing a growing and productive sector with a

¹⁸ Schwartz, Gerd, Manal Fouad, Torben Hansen, and Geneviève Verdier, eds. 2020. Well Spent: How Strong Infrastructure Governance Can End Waste in Public Investment. Washington, DC: International Monetary Fund. 341 p. ISBN: 978-1-51353-205-9

¹⁹ https://link.springer.com/chapter/10.1007/0-387-22854-3_9

workforce is critical, which means reviewing existing adult education programs and encouraging a shift of labour from less productive to productive sectors.

Accelerated growth scenario requires the institutional sustainability and effectiveness of the Government of Latvia. The success of accelerated growth depends on a set of measures organized by the government to reduce vulnerability. The public opinion survey of reCOVery-LV²⁰ shows that 35% of respondents feel proud of the Latvian government response to the *Covid-19* crisis; 50,5% consider that in the emergency situation the public institutions provided their services well and even better than before pandemic crisis.

Accelerated growth will depend on productivity, investments and *innovation*. *Innovation activity in Latvia is relatively small*. Insufficient investments in R&D, low overall results in innovation and average results in education have a negative impact on Latvia's efforts to achieve higher productivity. Latvia's performance in the field of innovation could benefit from a more active involvement of the largest state-owned companies, which have the resources to afford significant investments even during pandemic crisis. In response to the *additional task of the Ministry of Economy*, the research team analysed innovation trends in Latvia's enterprises during *Covid-19* crisis compared with other EU countries and formulated recommendations to policy makers to promote innovation after the crisis. Particular attention was paid to strengthening the innovation's demand side, for instance through the innovation procurement. The outcome of this sub-project is summarised in Annex 10.

According to *additional tasks of the Ministry of Economy*, the research team elaborated on the *development of e-commerce and reduction of paper circulations in the wake of the pandemic crisis* (Annex 11). The research team has not identified any legal obstacles to the speedy growing e-commerce. A detailed action plan of implementing regulatory rules more efficiently and user-friendly, would accelerate the e-commerce development in Latvia. The biggest obstacle, especially in the SME sector, is that business leaders and executives lack understanding and knowledge of the e-commerce benefits. The shortage of specialists in the field of e-commerce is a key.

Acceleration of digitalisation and e-commerce during Covid-19 crisis facilitated the transition from the paper use to the electronic documentation in the state and municipal institutions, motivating the private sector to follow this example. Digital document circulation and the use of digital signatures have increased by 90% in 2020. Two surveys, expert interviews and discussions with professional NGOs have been carried out to find ways for encouraging companies to use e-commerce and reduce the circulation of paper documents.

Finally, the research team elaborated on the *constitutional and administrative framework* for effective management of pandemic and other emergency situations (Annex 12). The experience of the Latvian parliament has been unique in a comparative perspective. The digital tools used in the remote sittings of the parliament and its commissions, in the context that no legal amendments were made neither in the Constitution nor in the Rules of Order of the Parliament, show that in general the Latvian Constitutional framework is extraordinary flexible regarding functioning of the constitutional institutions during the times of crisis. However, the use of remote sittings and the accrued experience should be elaborated in law for the purposes of legal certainty. Proposals have been made for several changes in legal regulation regarding necessity to grant government additional powers during the emergency situations.

The technological availability of software and hardware for a safe use of videoconferences and their wide use in everyday communications during the pandemic as well as remote sittings of the Parliament has provided an opportunity for implementation of a universal e-platform, which could be used in post-pandemic situation in many administrative proceedings and in many instances completely substituting in-person visits. Recommendations have been drafted setting out legal conditions of such an e-platform as well as a roadmap for its elaboration. Analysis of the surveys shows that there is a willingness both from the public employees and the society to have such an alternative of communication and decision making.

The analysis of the data shows that, contrary to expectations, the pandemic has had a rather little impact on employment situation in the public service. Although some institutions have had major changes to their workload, most employees of the government have not been affected by workload or salary. Nonetheless, to address eventual workloads or downtimes, proposals have been drafted in order to allow more flexible legal regulation in the public service in both normal times and times of emergency.

Deliverables: 7 reports submitted to the Government, 1 report submitted to and presented at the Baltic Assembly, 28 papers published, 11 papers accepted for publications (Annex 14), 63 presentations at the national and international research conferences (Annex 13), reviewed monograph submitted for publishing.

2. Impact

²⁰ <https://bit.ly/reCOVery-LVsabiedriskāsdomasaptaujasrezultātuapkopojums>

2.1. Impact of the project and its results on policy-making and economy sectors by ensuring knowledge transfer and planning cooperation

Table No. 1

No.	In cooperation with	Description and result of the cooperation activity	Time period
1.	Foresight Centre at the Estonian Parliament, Lithuanian Government Strategic Analysis Centre “Strata”	Report <i>A comparative review of socio-economic implications of the coronavirus pandemic in the Baltic States</i> ²¹ presented on 6 November 2020 at the Baltic Parliamentary Assembly ²² .	August – 6 November
2.	Ministry of Economics, Latvian Employers Confederation, Latvian Chamber of Commerce and Industry, European Commission	“Latvian Productivity Report-2020” (LPR-2020), presented at the Latvian Productivity Dialogue (LPD) and submitted to the Latvian government and European Commission DG ECFIN in early December (Annex 6, 9)	LPD on 25 November; LPR-2020 July-November
3.	Ministry of Economic (EM)	Report “Assessment of the impact of remote work on long-term productivity and proposals for increasing productivity in remote working conditions” submitted to the EM (Annex 7)	November-March
4.	Ministry of Economics	Report “Innovation trends and proposals to boost innovation in times of economic crisis” submitted to the EM (Annex 10)	November - March
5.	Ministry of Economics	Report “Development of e-commerce and reduction of paper circulations in the wake of the pandemic crisis” submitted to the EM (Annex 11).	July-March
6.	Ministry of Justice (JM)	Report “Constitutional and administrative framework for effective management of pandemic and other emergency situations” submitted to the JM (Annex 12)	July-December
7.	Ministry of Agriculture (AM)	2 reports on “Restructuring of local agricultural and food supply chains and strengthening of resilience in crisis and post-crisis conditions in Latvia” submitted to the AM and EM (Annex 3)	July-December
8.	Ministry of Foreign Affairs (MFA)	Report “International political risks and future scenarios” submitted to the MFA (Annex 5)	July-November
9.	Repository of the University of Latvia	All collected surveys’ data are available: https://dspace.lu.lv/dspace/handle/7/53911	December-March

2.2. Impact of the project and its result conclusions and suggestions will be based on theoretical analysis, policy planning documentation analysis and survey analyses s on the general public, by ensuring knowledge transfer and by promoting the understanding of role and contribution of research to society

Table No. 2

No.	Activity (e.g., interview in media)	Description (in cooperation with, target group, if applicable, homepage etc.)	Time period
1.	News portal article on the public opinion survey by “reCOVery-LV”	https://lvportals.lv/dienaskartiba/326476-aptauja-nacionalisms-pandemijas-laika-ir-samazinajies-2021 »lvportals.lv, 21-03-29 https://www.delfi.lv/news/national/politics/nacionalisms-pandemijas-laika-ir-samazinajies-secinats-aptauja.d?id=53069551 »delfi.lv, 21-04-03	29 March 2021

²¹ https://www.riigikogu.ee/wpcms/wp-content/uploads/2020/11/Baltic-Assembly_final_02.11.2020.pdf

²² <https://www.riigikogu.ee/en/press-releases/others/the-baltic-assembly-sums-up-estonias-presidency/>

2.	<p>Public discussion <i>“Medicines to treat Covid-sick economy and risks of chronical illness”</i> organized and moderated by “reCOVery-LV” project leader Inna Šteinbuka.</p> <p>Opened by President of Latvia and Governor of the Bank of Latvia Attended by politicians, researchers, NGO’s, entrepreneurs and students.</p>	<p>https://www.lsm.lv/raksts/zinas/ekonomika/video-diskusija-covid-19-zales-ekonomikas-arstesanai-un-hroniskas-slimibas-riski.a395232/ »lsm.lv, 21-03-04</p> <p>https://skaties.lv/zinas/bizness/ekonomika/latvijas-zinatnieki-sagatavojusi-ieteikumus-kadas-zales-covid-19-krize-vajadzegas-latvijas-ekonomikai/ TV3 news, skaties.lv, 21-03-05</p> <p>https://lvportals.lv/dienaskartiba/325417-latvijas-vadosie-eksperti-un-politiki-piedalises-diskusija-covid-19-zales-ekonomikas-arstesanai-un-hroniskas-slimibas-riski-2021</p> <p>The recording of the discussion was also broadcast on the new television channel TV4. Discussion recording: https://www.youtube.com/watch?v=nTq3oGN1dK0&list=PLxc2e81TLgVTOFxHvGdyUSKw1dLr23I4i</p>	4 March 2021
3.	Interviews and discussion outlining the project, progress and results	<p>https://xtv.lv/rgatv24/video/8blGbXJ6Nn3-04_03_2021_la_dolce_vita_ar_roberto_1_dala</p> <p>https://xtv.lv/rgatv24/video/46Vpo1wa7Eb-04_03_2021_la_dolce_vita_ar_roberto_2_dala »RigaTV24, xtv.lv, 21-03-04</p>	4 March 2021
4.	Inna Šteinbuka. Presentation of the project at online panel discussion “Science against Covid-19”,	<p>https://www.delfi.lv/tiesraides/paneldiskusija-zinatne-pret-covid-19-spriez-par-latvijas-zinatnieku-petijumu-rezultatiem-un-to-pielietojumu.d?id=52900985 »delfi.lv, 21-02-03</p> <p>Discussion recording: https://www.youtube.com/watch?v=dthPhbeYAzM</p>	10 February 2021
5.	Interviews and discussion outlining the project, progress and results	<p>Discussion participants Inna Šteinbuka, Gundars Bērziņš and Oļegs Krasnopjorovs.</p> <p>https://xtv.lv/rgatv24/video/eMZN296kpz3-07_02_2021_nacionalo_interesu_klubs_1_dala?fbclid=IwAR0jcAnIIKbmT16mSSDuMD9Mnbi_f6YKKKe3PbUTGK_XMIAFRwEL1qPnxTas</p> <p>https://xtv.lv/rgatv24/video/4rP7eDkrNBR-07_02_2021_nacionalo_interesu_klubs_2_dala?fbclid=IwAR2geSN3TYvqbLGDXEJe7TD6sAYb5dWVvEyNKLKQ_MYCOLRW9M6otgDKyKsg »RigaTV24, xtv.lv, 21-02-07</p>	7 February 2021
6.	News portal article by prof. Gundars Bērziņš, prof. Jānis Priede, outlining the project, progress and results	<p>https://www.delfi.lv/news/versijas/gundars-berzins-janis-priede-valsts-atbalsts-uznemumiem-jasniedz-divos-limenos.d?id=52899097 »RigaTV24, xtv.lv, 21-02-04</p>	4 February 2021
7.	News portal article by prof. Inna Šteinbuka, outlining the project, progress and results	<p>https://www.delfi.lv/news/versijas/inna-steinbuka-ka-panakt-ekonomikas-atveselosanos.d?id=52830573</p>	13 January 2021
8.	Inna Šteinbuka. Presentation of the recovery-LV –based	Discussion organised by the State President ²³	20 November 2020

²³ <https://www.president.lv/lv/jaunumi/zinas/valsts-prezidents-sabiedribai-ir-tiesibas-prasit-ierobejojumu-ieverosanu-lai-aizsargatu-cilveku-veselibu-un-dzivibu-26496#gsc.tab=0>

	conclusions on public perceptions of national sustainability		
9.	Online conference “Productivity Dialogue” Attended by researchers, politicians, NGO’s, entrepreneurs, EC officials and EU MS productivity board’s members.	Moderator: Inna Šteinbuka. Reports: Gundars Bērziņš; Jānis Priede; Olegs Krasnopjorovs; Olegs Baranovs. Conference Programme and Video: https://www.bvef.lu.lv/en/research/research/scientific-institutes/university-of-latvia-think-tank-lv-peak/translate-to-english-produktivitatis-dialogs/ Conference was streamed on Facebook: https://www.facebook.com/lubgef	25 November 2020
10.	News portal article on the online conference “Productivity Dialogue”	https://nra.lv/ekonomika/latvija/331188-aseradens-latvija-jasagatavo-ekonomiskam-lecienam-pec-krizes.htm »nra.lv, 20-11-25; https://www.tvnet.lv/7118116/aseradens-pec-krizes-jagatavojas-ekonomiskam-lecienam »tvnet.lv, 20-11-25; https://lvportals.lv/dienaskartiba/322180-tiessaistes-konference-prezentes-latvijas-produktivitates-zinojumu-2020-2020 »lvportals.lv, 20-11-23	23-25 November 2020
11.	Interviews outlining the project, progress and results	Project leader Inna Šteinbuka: 20-11-26, TV24 » https://xtv.lv/rigatv24/video/4rP7e26eGBR-26_11_2020_dienas_personiba_ar_veltu_purinu ; Gundars Bērziņš: 20-11-25, Latvijas Radio 1 » https://lr1.lsm.lv/lv/raksts/pusdiena/pusdiena-25.11.2020.a137107/ ; Vineta Kleinberga: http://www.sz.lv/lv/raksti/sabiedriba/r/59226-peta-pirma-vilni » Newspaper “Saldus Zeme”, 20-10-16; Gundars Bērziņš: 2020-10-13, makroekonomika.lv » https://www.makroekonomika.lv/budzeta-izdevumi-skarsgiezuma-parfinansetas-nozares-mits-vai-realitate	October-November 2020
12.	News portal article on the public opinion survey by “reCOVery-LV”	https://skaties.lv/zinas/latvija/sabiedriba/aptauja-latvijas-sabiedriba-pozitivi-noverte-valdibas-darbu-arkartejas-situacijas-laika/ » Skaties.lv, 20-10-27; https://www.tvnet.lv/7095801/aptauja-latvijas-sabiedriba-pozitivi-noverte-valdibas-darbu-arkartejas-situacijas-laika » Tvnet.lv, 20-10-27; https://rus.delfi.lv/news/daily/latvia/opros-latvijskoe-obschestvo-polozhitelno-ocenivaet-rabotu-pravitelstva-v-period-chrezvychajnoj-situacii.d?id=52603663 » Rus.delfi.lv, 20-10-27; https://www.reitingi.lv/lv/news/izglitiba/138654-projekts-recovery-lv-sabiedriba-noverte-valdibas-darbu-arkartas-situacija.html » Reitingi.lv, 2020-10-28; https://lvportals.lv/dienaskartiba/321361-projekts-recovery-lv-sabiedriba-noverte-valdibas-darbu-arkartas-situacija-2020 » lvportals.lv, 20-10-28	27-28 October 2020
13.	News portal report on the conclusions of the online conference “Productivity Dialogue”	Report in news portal lvportals.lv https://lvportals.lv/nories/322316-ekonomisks-leciens-vai-iedzineju-loma-2020	27 November 2020

2.3. Impact of the project and its results on the respective field and the development of research community in Latvia, its international competitiveness

Table No. 3

No.	Collaborating institution/organisation, country	Type of collaboration	Time period
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1.	International research project in “Baltic Research Programme” under EEA/Norway grant: “REgional convergence, Social COhesion and Productivity under technological change and vulnerabilities to transmission of virulent diseases (RESCOP)”. The consortium: project promoter- University of Latvia (LU), partners- Latvian Academy of Sciences (LAS); Vilnius Gediminas Technical University (Vilnius Tech); Tallinn University of Technology (TalTech); University of Reykjavik (UR); Østfold University College (ØUC).	International consortium, project coordinator- LU (Prof. Inna Šteinbuka). In total, 31 and 8 PhD students with research backgrounds in economics, business, sociology, regional studies, software science and mathematics. Further research on how technological progress can accelerate productivity-based growth and distribute it across social groups and regions.	Project submitted October 18,2020 2021-2024
2.	International research project in “Baltic Research Programme” under EEA/Norway grant: “New agenda of Regional Economy: Remote Labour Challenges and Possibilities and its Impact on Creation an Ecosystem of Innovation and Regional Economic Development”.	Further research of regional development and impact of the remote work.	Project submitted October 19,2020 2021-2024
3.	Horizon 2020 SwafS project application was successful for a project “FIT FORTHEM – Fostering Institutional Transformation of R&I Policies in European Universities”	Latvian FORTHEM ²⁴ (a consortium of the seven EU Universities) lab “Experiencing Europe” coordinated by Prof. Inna Šteinbuka, will participate at the project.	2021-2023
4.	Horizon 2020, BIOEAST – Central and Eastern European Initiative for Knowledge-based Agriculture, Forestry and Aquaculture in the Bioeconomy	Research in 2021-2022 will use “reCOVery-LV” findings	2019-2022
5.	Horizon 2020, H2020-BB-2016-2017 6-2017. No. 773297-2 Bio-based innovation for sustainable goods and services - Supporting the development of a European Bioeconomy. Monitoring the Bioeconomy (BioMonitor)	Research in 2021 will use “reCOVery-LV” findings	2018-2021

Table No. 4

Doctoral, master's and bachelor theses supervised or provided with advice from the principal investigator or the lead participants within the framework of this project (if the theses have been defended, indicate this in the last column of the table, also specifying the date and the promotional council)				
No.	Thesis author	Thesis title	Supervisor or consultant	Defence
1.	Ina Gudele	Doctoral thesis: <i>Factors of E-commerce Development in SME Sector in Latvia</i> . Co-author of the report “ <i>Development of e-commerce and reduction of paper circulations in the wake of the pandemic crisis</i> ” (Annex 11)	Prof. Baiba Rivza (WP4)	Pre-defence on 06.02.2021
2.	Dace Stefenberga	Doctoral thesis “ <i>Potential of Innovative Entrepreneurship for Region's Economic Growth</i> ”	Prof. Baiba Rivza (WP4)	

²⁴ <https://forthem-alliance.eu/>

3.	Mihails Šilovs	Doctoral thesis “ <i>Development Possibilities of the Fish Processing Industry in Latvia</i> ”	Prof., Dr.oec.Irina Pilvere (WP5)	
4.	Ilze Zumente	Doctoral thesis “ <i>Effective Implementation of Environmental, Social and Governance principles in Central and Eastern European companies</i> ”	Prof. Natalja Lāce (WP3)	
5.	Ludmila Kasperovica	Doctoral thesis “ <i>Economic models of profit management for small and medium sized enterprises in the digital age</i> ”	Prof. Natalja Lāce (WP3)	
6.	Ligita Āzena	Doctoral thesis “ <i>Territory competitiveness for smart business development in the Pieriga region</i> ”	Prof. Baiba Rivza (WP4)	

2.4. Project's scientific results and ensuring of their accessibility

To date, the project has published five open access publications, see the list of scientific publications of the project in Annex 8.

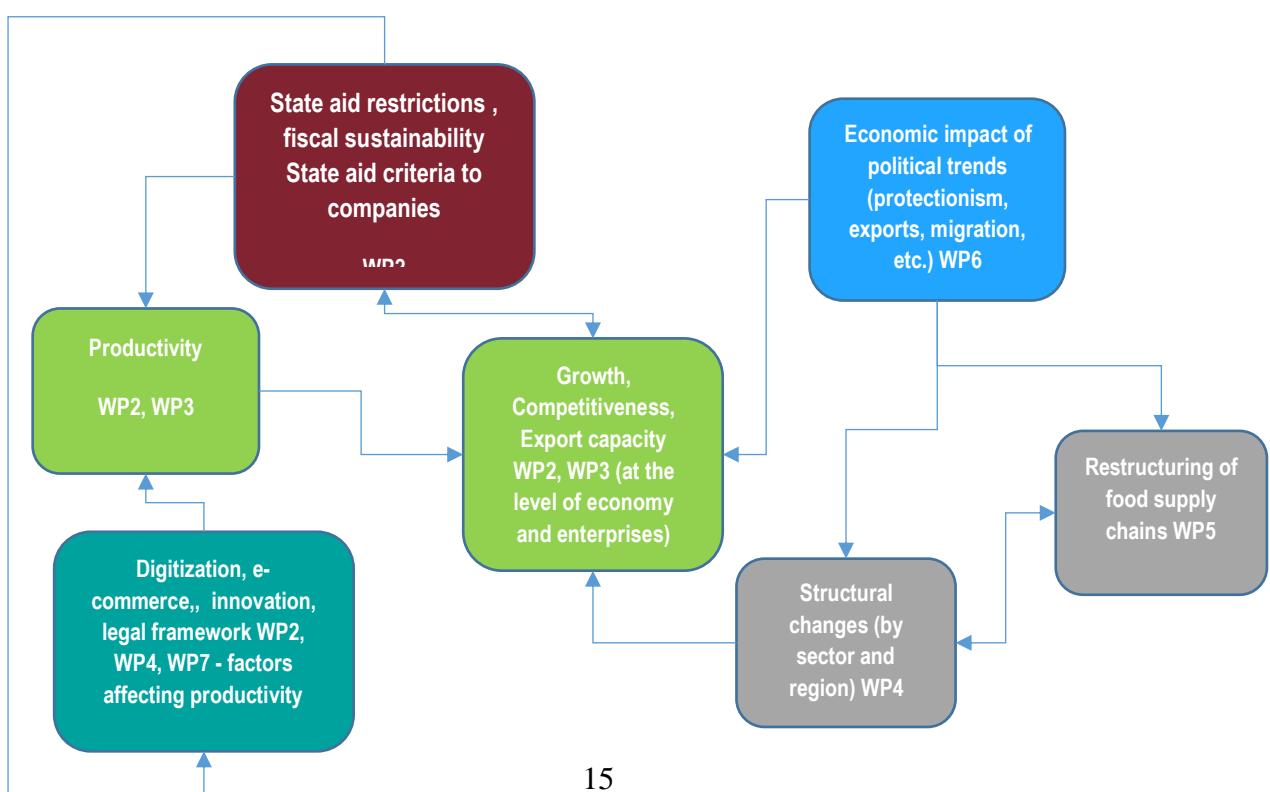
3. Implementation

At the start, a Steering Group (SG) has been established coordinated by the Project Leader (PL). The SG consists of all WP Leaders and include communication, accounting and legal experts and technical assistant. In order to achieve project heterogeneity and prevent fragmentation, the PL has identified linkages among Work Packages (Fig.3.).

The SG at its regular monthly meetings strictly followed project implementation progress and the achievement of performance indicators. Regular discussions with the stakeholders (ministries, NGOs, experts) helped adjust or even add new tasks. New tasks added in the research process include: (1) elaborating on national sustainability concept and (2) working out state support criteria for companies.

The staff of the project amounts to 78 researchers, out of which 18 are doctoral and master's degree students. Timely planning and regular revision of intermediate results allowed to meet performance indicators.

Fig.3. Linkages among reCOVery-LV Work Packages (WP)



Annex 1

reCOVery-LV research project: description and structure of the tasks (WP1)

reCOVery-LV is an academic multidisciplinary applied study that aims to develop interdisciplinary policy recommendations. The research goals and tasks of *reCOVery-LV* stem from both the governmental funding program, under which the *reCOVery-LV* was commissioned (Cabinet of Ministers Order No. 278 of 20 May 2020) and the *reCOVery-LV* project application.

1. The horizontal tasks defined in the governmental funding program

Overarching goal: to contain the spread of Covid-19 infectious disease and to protect the population with the aim to urgently restore economic activity and socially active daily life through innovative research.

Goals: to develop scientifically justified Latvia's future scenarios for autumn 2020, 2021 and 2022, including policy actions for overcoming new lockdowns. Research fields are economic development and public welfare, which include (1) economic sustainability and resilience against pandemics, (2) post-crisis development opportunities, (3) societal behaviour patterns, (4) psychological resilience in times of crisis, (5) education sectors, and (6) value transformations.

Specific tasks (point 6.9):

1. Carry out research and develop solutions for the resilience of the Latvian economy to the crisis caused by the pandemic and post-crisis development opportunities;
2. Carry out research and develop solutions for optimal knowledge transfer of crisis-driven innovation
3. Provide an assessment of the prospects of global supply chains and Latvia's sufficiency with critical infrastructure and materials.

The research teams are expected to produce policy proposals in the following specific areas:

- 1) business promotion in the e-environment (e-commerce);
- 2) paper reduction in the economy;
- 3) impact of telework on productivity;
- 4) processes and products innovation as the crisis' response.

The program-specific additional results are presented in Table 1.

Table 1.1 Project specific results

Description of the expected outcome	Specific directions	The deliverables
1. Proposals for amendments to laws and regulations of the Cabinet of Ministers in order to promote business in the e-environment	To study legislation at the national level, identifying laws and regulations of the Cabinet of Ministers that both promote and restrict commercial activities in the e-environment (including e-invoices, e-signature, regulatory enactments for data storage, etc.).	Methodological and conceptual proposals and recommendations
2. Proposals to reduce the circulation of paper in the economy, as well as the development of a paper circulation accounting mechanism and the accounting and digitization of traditional paper-based processes and services	(1) Qualitative and quantitative analysis based on an assessment of the current situation of changing paper traffic between public administrations, businesses, public administrations and businesses, and public administrations and society since the Covid-19 state of emergency. (2) Qualitative and quantitative analysis based on the assessment of the development of new public sector digital tools and services since the beginning of the Covid-19 crisis, which replaces the previous paperwork.	Concrete recommendations and proposals based on analysis have been developed and summarised in a report submitted to the Ministry of Economics
3. Assessment of the long-term impact of telework on productivity and preparation of proposals	(1) To assess the impact of telework on Latvia's productivity (private / public sector) in the long run, as well as to develop proposals for increasing the productivity of employees in telework conditions.	Assessments and recommendations summarised in report submitted

for increasing productivity in telework conditions.	(2) To assess the factors promoting and limiting productivity in teleworking conditions and to provide recommendations to managers for wider involvement of employees and increase of productivity in teleworking conditions.	to the Ministry of Economics
4. Assessment of development trends of different types of innovations (process / products) during economic instability (crisis)	<p>(1) To evaluate the development trends of various types of innovations (process / products) in the business sector during economic instability (crisis) and in the post-crisis period.</p> <p>(2) To assess the factors promoting and limiting innovation in the business sector and to provide recommendations for increasing innovation activity in the crisis / post-crisis period.</p> <p>(3) Carry out an assessment of the role of the state in ensuring innovation procurement (e.g. innovation public procurement, pre-commercial procurement) and provide recommendations for public sector initiatives to ensure public innovation procurement in the crisis / post-crisis period.</p>	Assessments and recommendations summarised in report submitted to the Ministry of Economics

2. Objectives of the reCOVery-LV project:

- 1) To develop a comprehensive multidisciplinary impact assessment of Covid-19 on the Latvian economy;
- 2) To elaborate scientifically proven and innovative interdisciplinary policy recommendations on public support and investment (including EU funding) targeted at overcoming immediate and future challenges posed by the pandemic for the sustainable and inclusive economic development.

The tasks defined in the reCOVery-LV project application

The reCOVery-LV project application had defined the project focus on:

- 1) Productivity and competitiveness: comprehensive macroeconomic, sectoral and regional analysis, future scenarios, export potential, infrastructure development and fiscal sustainability;
- 2) The resilience of Latvian companies in crises and potential solutions for the improvement;
- 3) Structural changes in the Latvian economy;
- 4) Restructuring and resilience of local food production and supply chains in crisis and post-crisis periods;
- 5) International political and related economic risks;
- 6) Constitutional and administrative aspects of effective state management external shocks (pandemics).

reCOVery-LV research questions arising from the research tasks and the horizontal theoretical framework:

- 1) Has the Covid-19 pandemic caused structural changes in Latvia's economic sectors?
- 2) Are the observed institutional changes initiated by the government or, on the contrary, related to the circumvention of existing rules or their arbitrary reinterpretation? How to make government reforms more responsive to the needs of entrepreneurs, thus avoiding spontaneous response by these entrepreneurs?
- 3) What is the impact of the pandemic on Latvia's export industries on a regional and global scale? Which direction is more promising from Latvia's point of view: to continue to integrate into global supply chains or – on the contrary – to detach from these chains substituting them for deeper regional (European) cooperation? How to balance the need for greater self-sufficiency with deepening export specialization?
- 4) How does the pandemic affect the development of skills, know-how and capital in Latvia: will it lead to lower exports of know-how and higher capital movements in the economy? Are all three preconditions for innovation in place: determined institutions, favourable public policies and cost-cutting measures?
- 5) What is the impact of the pandemic on people's perceptions of each other (community dimension), public institutions (national dimension) and major international organizations such as the EU? Will a pandemic lead to greater reliance on the state and greater alienation from international structures?

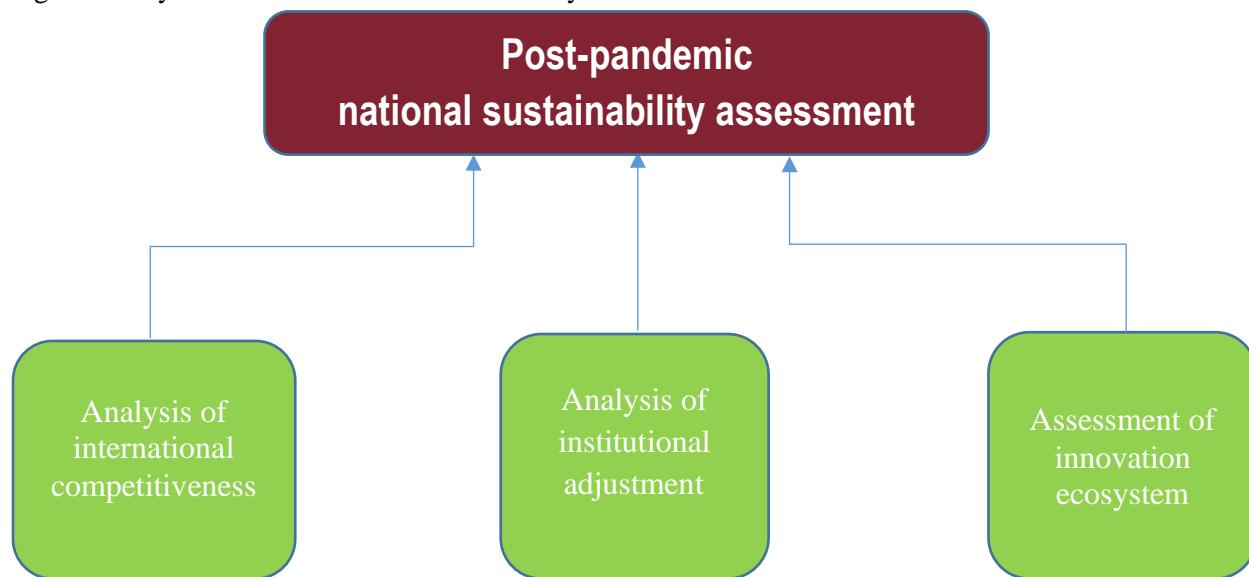
The interaction between the goals and objectives of the funding program and the reCOVery project is shown in Table 2.

Table 2. Aims and tasks of reCOVery-LV

<i>reCOVery-LV the aim</i>	<i>reCOVery-LV tasks</i>	<i>reCOVery-LV work directions (WP)</i>		<i>Overall objective of the program</i>	<i>Program specific tasks reCOVery</i>	<i>Additional tasks of the program reCOVery-LV</i>
<p>1) To develop a comprehensive and multidisciplinary assessment of the impact of Covid-19 on the Latvian economy;</p> <p>2) To elaborate scientifically proven and innovative interdisciplinary policy recommendations on public support and investment, including EU funds targeted at overcoming the challenges posed by the pandemic for the sustainable and inclusive growth.</p>	<p>1) Critical assessment of the current policies aimed at reducing the damage caused by the pandemic;</p> <p>2) Working out Latvia's macroeconomic scenarios taking into account the dynamics of both domestic and international political developments;</p> <p>3) Developing an innovative set of scientifically sound and applicable policy recommendations for policy makers.</p>	<p>1) Productivity and competitiveness (WP2);</p> <p>2) Crisis resilience of Latvian companies and potential solutions for its improvement (WP2, WP3);</p> <p>3) Structural changes in the Latvian economy (WP2, WP4);</p> <p>4) Restructuring and resilience of local food production and food chains (WP5);</p> <p>5) International political and economic risks (WP6);</p> <p>6) Constitutional and administrative legal solutions (WP7).</p>		<p>Scientifically justified short and medium-term political and economic development scenarios:</p> <p>1) the resilience of the economy to pandemics and other external shocks;</p> <p>2) post-crisis development opportunities and international political impact;</p> <p>3) patterns of societal behaviour;</p> <p>4) psychological resilience in crisis conditions;</p> <p>5) transformations of the R&D and education sector;</p> <p>6) value transformations.</p>	<p>1) Carry out research and develop solutions (productivity growth, state aid, digitalisation, e-commerce, remote work, etc.) for strengthening resilience of the Latvian economy to the crisis and post-crisis development opportunities;</p> <p>2) Carry out research and develop solutions for in relation to crisis-driven innovations;</p> <p>3) Providing an assessment of the prospects of global production chains and Latvia's sufficiency with critical infrastructure and materials (case study on food production)</p>	<p>Proposals and recommendations regarding:</p> <p>1) business promotion in the e-environment (e-commerce);</p> <p>2) reducing paper in the economy;</p> <p>3) the impact of telework on productivity;</p> <p>4) process and product innovations caused by the crisis.</p>

The theoretical framework of reCOVery-LV (WP1)

The theoretical framework of reCOVery-LV focused on national sustainability assessment (Figure 1).
 Figure 1. Key elements of national sustainability



a) analysis of international competitiveness

The analysis of international competitiveness is based on the theory of Varieties of Capitalism,²⁵ which asserts that varieties in political and economic institutions guide companies to a certain type of corporate (business) strategy. However, notwithstanding these institutional differences, countries are able to compete successfully with each other, which is due to the so-called institutional complementarities – a situation when institutional idiosyncrasies in different areas reinforce each other. E.g., in Latvia's case (as in other CEE countries) such institutional complementarity exists between low labour (and education) costs, low tax burden and access to EU funding for development purposes.

b) analysis of institutional adjustment

Within institutions, the actions of individuals become predictable, sustainable and purposeful, hence, institutional embeddedness of economic sustainability measures is of paramount importance. From the academic point of view the aim of the reCOVery-LV project was to provide answer to the question of what institutional improvements are required in Latvia to increase the resilience of the national economy. For research purposes, following Ostrom's insights,²⁶ this study defines institutions social structures that promotes the regularity of individuals' social behaviour and the uniformity of results. A defining feature of institutions are rules which effectively contain sanctions for unsolicited actions of individuals.

Institutions exist at different levels of government and usually form a hierarchy in which higher level institutions influence (limit) the activities of lower level institutions. *Organization* is a set of institutions, within the framework of which the interaction of institutions is regulated by means of procedures or – in other words – rules on how the output of one institution becomes the input of another institution.²⁷ Literature distinguishes between three levels of institutions: (1) operational, (2) management and (3) constitutive level. Each level is characterized by a specific functional task and type of results (Table 1).

²⁵Hall, PA & Soskice, D. (2003). Variety of Capitalism: The Institutional Foundations of Comparative Advantage (Oxford: Oxford Scholarship Online).

²⁶Ostrom, Elinor (2005). Understanding institutional diversity (Princeton University Press: Princeton and Oxford), 3.

²⁷Ostrom, Elinor (2005). *Understanding institutional diversity* (Princeton University Press: Princeton and Oxford), 179.

Table 1. Hierarchy of institutions within an organization

Institutional level	Function	Outcome
Operational institutions	Daily decisions (supply, production, distribution, etc.)	The actions of individuals that directly affect things
Management institutions	Regulates the operation of operational institutions (range of participants, division of functions, etc.)	Actions of individuals that directly affect operational institutions
Institutions of constitution	Regulates the operation of management institutions (basic principles, structure, etc.)	Actions of individuals that directly affect governing bodies

It is necessary also to make a distinction between formal and informal institutions:²⁸

- *Formal institutions* refer to rules crafted by public administration institutions (legal acts, administrative decisions, court judgments) and embody public morality;
- *Informal institutions* refer to various social influences (families, peers, society), which are manifested in the dominant discourse (dominant opinion), traditions and values (beliefs about right and wrong behaviour) and embody individual morality.

For example, when formal institutions (statutory public morality) do not coincide with informal institutions (individual morality), as manifested in low levels of public trust in government and the rule of law, favourable conditions are created for illegal activities, including the shadow economy and low tax discipline.²⁹

The conceptual approach to institutional adjustment is based on the distinction between three possible scenarios for the transformation of economic institutions as a result of economic shocks.³⁰ The first is the path of state-initiated reforms. Such reforms are based on a political compromise between stakeholders (political forces / social partners). Although the preferred path, the problem is that such reforms do not always lead to greater economic efficiency. The second way is for companies to arbitrarily evade the existing rules (rules of the game). This can take the form of, for example, withdrawal from employers' collective agreements or organizations representing businesses. The third path is less radical and involves the spontaneous reinterpretation of existing rules by companies without abandoning existing rules altogether. Such tendencies of reinterpretation can be demonstrated, for example, both by going to court to challenge certain aspects of the rules and by actions existence. Unlike the formal "reform" path, "reinterpretation" is like a bottom-up movement, signalling the need for change.

Different approaches can be applied to analysis of factors influencing the institutional change. In this project a holistic approach is adopted, namely, attention is paid to institutions as a whole without delving into interaction of internal components of institutions. The so-called theoretical currents of the new institutionalism are widely used in institutional research (Table 2). These currents are united by the recognition that institutions have a role to play in structuring social reality.

Table 2. Characterization of the currents of the new institutionalism

Theoretical current	Basic principle	Condition for change
Rational institutionalism	Institutions are a rational system of behavioural prescriptions and incentives that exist because they	Changes in the existing coalition of interests of individuals

²⁸Ioana Alexandra Horodnic (2018) "Tax morale and institutional theory: a systematic review," International Journal of Sociology and Social Policy, Vol. 38 Issue: 9/10, 868-886,<https://doi.org/10.1108/IJSSP-03-2018-0039>.

²⁹Colin C. Williams & Ioana A. Horodnic (2015), "Explaining and tackling the shadow economy in Estonia, Latvia and Lithuania: a tax morale approach," Baltic Journal of Economics, Baltic International Center for Economic Policy Studies, vol. 15 (2), pages 81-98.

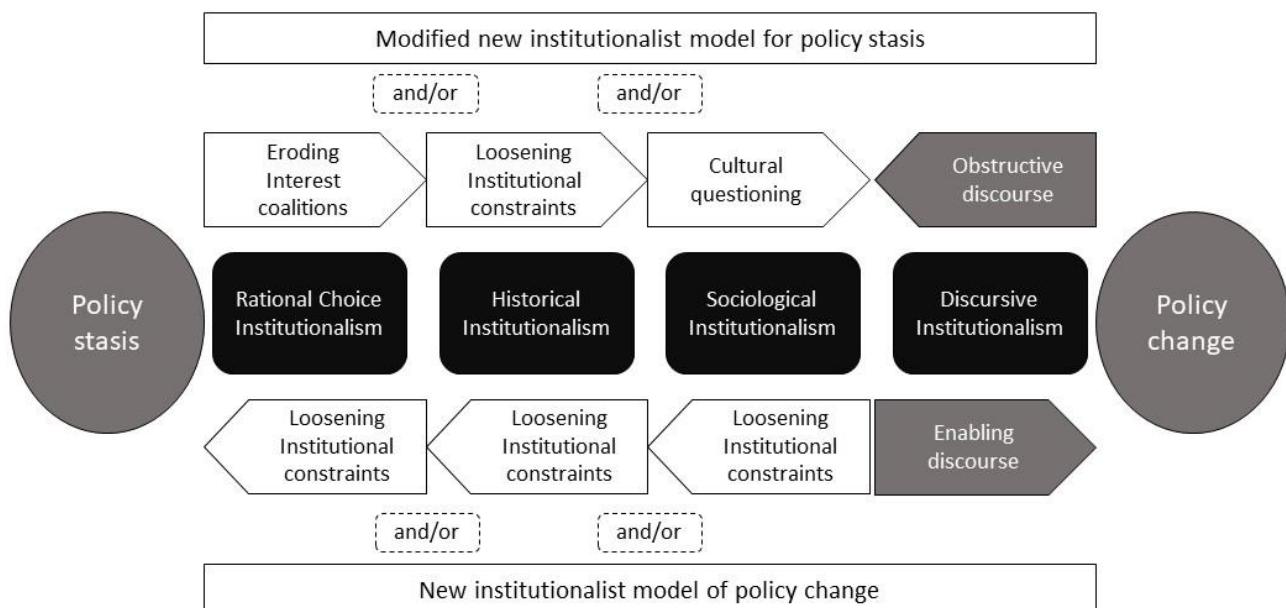
³⁰ Peter A. Hall and Kathleen Thelen (2007), "Institutional Change in Varieties of Capitalism," Socio-Economic Review, January 2009, DOI: 10.1093 / ser / mwn020.

	promote the well-being of individuals.	
Historical institutionalism	The original form of institutions has a significant impact on the subsequent operation and development of institutions	Significant shocks that reduce the force of historical inertia
Sociological institutionalism	Institutions play a role in shaping individuals' identities and interpreting values	Changes in values, adaptation to more successful examples
Discursive institutionalism	Existing dances and discourse affect the stability of institutions	Discourse change

From the point of view of the new institutionalism, institutional change takes place under the influence of external rather than internal factors. Figure 2 schematically shows the interactions of the currents of the new institutionalism in the context of institutional change as proposed by Hope and Raudla (2012). This approach has been singled out because it includes discursive aspects into the analysis of institutional change. As can be seen, notwithstanding other factors, the prevailing discourse can be either unlocking or, on the contrary, blocking the changes.

It is important to note that discursive institutionalism is based on the assumption that subjects who are participants of institutions, despite dominant views, historical experience and recognition of significance of the existing institutional set-up, are able to think and act outside the prevailing cognitive frames and persuade each other to change or not to change them.

Figure 2. New institutionalism and the causes and obstacles to institutional reform



Source: Mat Hope & Ringa Raudla (2012), “Discursive institutionalism and policy stasis in simple and compound policies: the cases of Estonian fiscal policy and the United States climate change policy,” Policy Studies 33: 5

As to organizations, depending on the depth of change, it is possible to distinguish two scenarios of organizational change: (1) fundamental change when the organization's identity changes and (2) adaptation when the organization's goals (strategy) and procedures (tactics) change but the identity does not change (Table 3).

Table 3. Manifestations and scenarios of organizational change

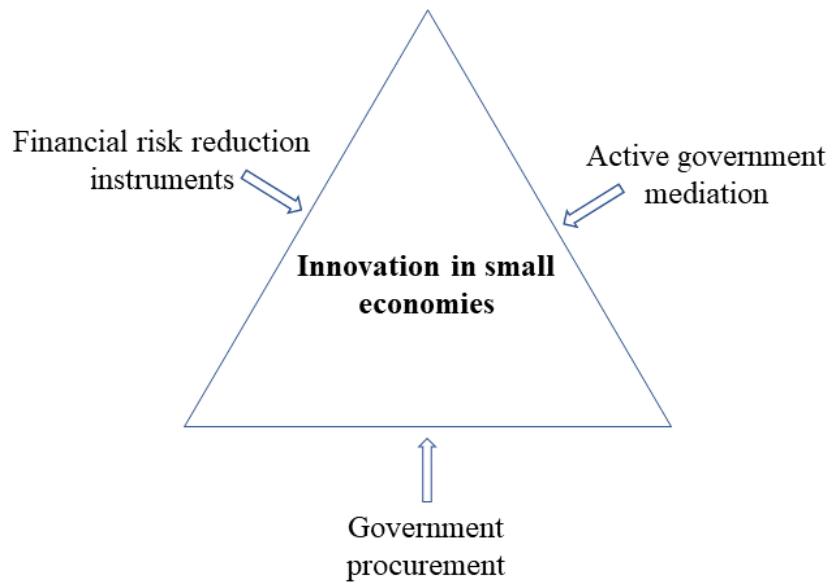
Depth	Object of transformation	Shape	Coverage	
Changes identity	Regulatory core	Fundamental transformation	Partial or complete change of core values, norms, principles and identity	
Adaptation	Goals	Strategic transformation	Redefining goals and objectives	
Adaptation	Procedures	Tactical conversion	Rearrangements of structures, procedures, policies, etc.	
Source: Zeki Sarigil, "Endogenizing Institutions," Dissertation thesis paper (University of Pittsburgh, 2007)				

c) Assessment of the institutional ecosystem of innovation

The assessment of the innovation ecosystem is based on a conceptual approach that analyzes the innovation processes in the economies of small countries. The authors³¹ of this approach argue that in small economies, technology transfer is not a linear (e.g., laboratory → company) process, because innovation is too risky and expensive for local companies, on the one hand, and foreign investment companies carry out innovation activities in their parent companies outside such countries as Latvia, on the other hand. This explains why the demand for innovation has been so low. Consequently, close government involvement is pertinent in fostering innovation (Figure 3). Such governmental inference can take three forms: (1) Development of financial instruments that reduce risks for entrepreneurs; (2) Government intermediation in attracting innovation investments and orders to local companies; and (3) Government procurement for innovation products, which may also include EU-level procurement.

³¹ Kattel, Rainer & Kalvet, Tarmo & Randma-Liiv, Tiina. (2010). Small states and innovation (Aldershot, England: Ashgate).

Figure 3. A framework for boosting innovations in small states



Summary of public opinion polls (WP1)

Several public opinion polls were conducted within the framework of the study project reCOVery-LV. The aim of these polls was to determine the public attitude towards:

1. Personal situation during pandemics, e.g., the impact on personal income, distance work and shopping patterns;
2. The public emergency assistance programs;
3. The quality of work of governmental institutions during the emergency;
4. The impact of pandemics on tax morale;
5. The political activity and radical polar views;
6. Latvia's most important trading partners and the EU.

The polls were conducted by the public opinion research center SKDS during the period from 11 to 22 September, 2020, surveying 1011 respondents aged 18 to 75 (the first phase) and from November 27 to December 11, 2020, surveying 1,008 respondents aged 15 to 75 years (the second phase). In both surveys a method of direct interview at the place of respondents' residence was used.

1. Personal aspects

The public opinion survey showed that the Covid-19 pandemic did not significantly change public satisfaction with life, compared to situation before pandemic. However, in December, compared to the September survey, respondents' satisfaction with life had deteriorated by an average of 0.4 points. Deterioration of the assessment was observed in all socio-demographic groups, but especially in the groups of young people, middle-aged, Russian-speaking, public sector employees, families with children and high-income respondents.

26.1 percent of respondents indicated that they have experienced a decrease in income during the pandemic, while 17.3 percent - as well as a decrease in expenses. 23.4 percent of respondents did experience temporary and long-term financial difficulties. At the same time, only one fifth (22.7 percent) of respondents admitted that by losing their monthly income, they would be able to cover current expenses without borrowing for more than three months. The survey also revealed that the longer a respondent was able to survive without regular income, the more likely this respondent was among those who had decided to make savings for rainy days. The impact of the pandemic on people's income had considerable regional differences.

During the first wave of the pandemic, approximately equal number of Latvians experienced both decrease (12.7 percent) and increase (12.3 percent) in workload. Among those respondents who worked remotely, however, changes in workload in both directions were experienced more often. Correlation of respondents replies revealed that the increase in workload had been moderately positively correlated with the increase in household income during pandemics.

Almost half (49.9 percent) of the population did not change their shopping habits, and more than half (53.5 percent) of the population did not change their payment habits. Elderly people with limited IT skills required for internet shopping were forced either to continue shopping in stores as before, or to give up shopping altogether.

2. Emergency programs

The survey revealed that most people considered the emergency support programs to be adequate and associated them with fiscal prudence. Compared to other EU member states, in Latvia, the level of public satisfaction with the governmental assistance was above the EU average.

About a third (35 percent) of respondents admitted that they were proud of the work of public authorities during the pandemic. Moreover, half of the respondents (50.5 percent) agreed to the claim that the public institutions were able to perform their functions as well or even better during the emergency, and somewhat less than half (45.7 percent) of respondents agreed with the opinion that the telework created due to the emergency had made public administration more modern and easily accessible to individuals.

Data analysis revealed that pride in government work during a pandemic was felt mainly by supporters of the ruling and "right" wing parties, while supporters of the opposition and "left" wing parties, on the contrary, was not.

People advocating tighter tax discipline and more responsible fiscal policies tended to support more restrictive access to national emergency support programs, while those who supported weaker tax moral and fiscal discipline advocated more inclusive state support programs.

Close to two thirds (63.5 percent) of respondents in the event of a recurrence of the Covid-19 pandemic were willing to admit restrictions to human contact as strict as during the first wave or even stricter and even higher number of respondents (70.9 percent) that in crisis situations, the state should act more decisively, even if it would involve greater interference in the personal lives of individuals.

3. Institutional aspects

27.1 percent of respondents admitted that confidence in democracy had increased during the pandemic, and 18.5 percent – that their voice mattered in Latvia. Despite satisfaction in performance of public authorities, overall, the public trust in national public institutions has decreased. The pandemic had also eroded trust in the EU institutions – even to a greater extent than in national institutions. Yet, 51.9 percent of respondents agreed that without EU support Latvia would not have been able to successfully contain the pandemic, and 61.6 percent – that the fight against the pandemic would be more efficient at the EU level.

Although correlation analysis revealed a very close relationship between the experience of long-term financial difficulties and respondents' intention to emigrate, survey also showed that 83 percent of respondents had not thought about leaving Latvia.

4. Taxation issues

Two-thirds (68.4 percent) of respondents agreed with the statement that tax evasion is a reprehensible behaviour, but only 18.6 percent agreed with the statement that people prefer to pay taxes as a result of the Covid-19 pandemic. The main reasons why people would not pay taxes were too low wages after taxes (54.3 percent) and too high tax rates (45.8 percent). Those who trusted public authorities were more likely to agree that tax evasion is reprehensible and that all non-taxpayers should be cracked down on. Likewise, the supporters of the ruling parties were more supportive of both for the current activities of the government and of fiscally prudence.

These data confirm the hypothesis raised by other studies³² that in Latvia a considerable gap persists between formal (i.e., legislative requirements that embody public morality) institutions and informal institutions (i.e., unwritten norms of behaviour that embody civic morality) in the field of taxation. Namely, the view that tax evasion is reprehensible reflects the existing public morality, while the view on the positive effect of a pandemic on tax morality of people – the civic morality. Moreover, the gap between formal and informal institutions was also indirectly confirmed by the respondents' view of the reasons why people do not pay taxes, namely, that the respondents were not inclined to blame the state for inefficiency of tax administration, thus demonstrating relatively little interest in stricter actions by the state against tax transgressors.

5. Political activity aspects

Since January 2019, the regularity with which respondents tend to be informed about political issues has decreased, but the social activity of respondents has increased, discussing political events with peers more often. During the pandemic, the number of opinion leaders had increased, and the share of opinion seekers had decreased. The share of political alienated had not changed significantly.

Nationalism had not strengthened during the pandemic: it combined with a number of other sentiments, and nationalism was more pronounced among the supporters of US than the EU, which could be related to the view that Latvia's national security is more dependent on the US.

³² Colin C. Williams & Ioana A. Horodnic (2015) Explaining and tackling the shadow economy in Estonia, Latvia and Lithuania: a tax morale approach, Baltic Journal of Economics, 15:2, 81-98.

6. International trade and the EU aspects

Regarding the opinion about Latvia's largest and most promising trade partners, the respondents tended to overestimate the role of China and the CIS countries in Latvia's foreign trade, and to underestimate the role of the EU. The importance of the EU in Latvia's foreign trade was more appreciated by Latvian-speakers, younger generations, the highly educated, managers and those respondents who regularly follow political events. The importance of the CIS, on the other hand, was more likely appreciated by Russian-speakers, older generations and those respondents who are not interested in politics. About a fifth of respondents agreed to the statement that cooperation should continue with countries where human rights violations take place.

Despite the decline in confidence in the EU institutions observed in the September survey compared to May 2017, the European public sentiment had significantly improved since September: the share of positive assessments of both the EU as a whole and Latvia's membership in the EU had increased. Examining the type of respondents' attitudes towards the EU, it was revealed that the share of optimists had significantly increased, but the share of deniers had decreased, especially in ethnic minority communities.

There had been an increase in public support for cooperation with the EU, but this support did not automatically translate into support for cooperation with the United States and the West more broadly – this testifies of a developing gap in this respect.

Summary of international political risks and future scenarios (WP6)

The research on international political risks identified four potential scenarios of the world post-COVID-19. These scenarios are outlined and elaborated in the full version of the report together with a detailed account on developments in a selection of major international actors: the European Union (EU), the United States of America (US), People's Republic of China (PRC) and the Russian Federation. They represent three largest economies in the world, as well as Latvia's biggest direct neighbour Russia. The report also gives an overview of future trends in the international political economy and provides recommendations for Latvia.

Due to the relatively short duration, the COVID-19 pandemic has not brought major structural changes in the interstate relations. It has put a hold on development in some sectors but has left major political processes largely intact. The Brexit proceeds, and the EU and the United Kingdom are on their way to reach an agreement on future trade relations, hopefully, by the end of the year. The US elections took place and demonstrated a change in country's leadership. The leadership of the EU consolidated its power, though neglect of COVID-19 pandemic restrictions in Ireland became a reason for small regrouping in the European Commission. The leaderships of the PRC and the Russian Federation remained the same.

Nevertheless, in a longer term more fundamental transformations might take place, reshuffling countries' domestic and interstate relations. The responses to the pandemic have caused anti-government protests in many Western democracies. They have even more affected the domestic political processes in smaller and poorer countries with internal political grievances, such as those in the "backyard of Russia". The elections in Belarus resulted in ongoing protests and mass disputes of the election results not only in Belarus itself, but also in the EU and beyond. The conflict over Nagorno Karabakh re-emerged after decades of being frozen. There is election turmoil in Kyrgyzstan partly due to COVID-19 travel restrictions of its workforce. As well, a pro-Russian incumbent at the presidential elections in Moldova has been defeated. These events demonstrate the challenges that the "Near Neighbourhood" of Russia experiences with further impact both on domestic development of these countries and balance of power at regional level.

Ongoing political turmoil in Venezuela, constitutional reform induced protests in Chile, presidential crisis in Peru demonstrate that the countries of traditional interest of the US are also being affected. The COVID-19 pandemic seems to have facilitated imbedded political turmoil in some countries, while procrastinating major changes in others. Nevertheless, mass protests and unsupportive reactions spur only in countries with deep-rooted economic and/or political problems. Countries like France, Poland, South Korea and others, which postponed yet held their elections, did not see post-election violence emerging.

Hence, **four potential scenarios** are presented for the future of the world after the COVID-19 pandemic:

- 1) **Status quo:** the return to the situation and relations before the outbreak of the virus. This scenario entails the world with a continued struggle between the free trade advocates and the proponents of protectionism. Opening the market to other countries is with gains and with losses as competitiveness is the central challenge. The world countries will continue battling over geopolitical and geo-economic gains via constant trade disputes arranged both on multilateral level, i.e. World Trade Organization, and bilaterally. The regional trade agreements promoted by the EU and among the Asian countries will continue to increase in the number. The tariff battles to do corrections in the global economic system and competition for the technological supremacy on global scale will continue.
- 2) **Increased solidarity and multilateralism:** COVID-19 will promote trade and will undermine protectionist rhetoric because the services sectors in many countries will experience severe recession due to social distancing requirements. Countries unwilling and unable to bare additional job losses due to reduced trade will limit the protectionist rhetoric and measures. Multilateralism will return as neo-sovereignist politicians or their rhetoric will start fading away due to inability to bring the promised rapid improvements in living standard. Lacking visible achievements on global political and economic arena the "strongmen" in many countries will be outcompeted by more traditional, centrist pro-collaboration forces. Dispute settlement in multilateral forums and via collaboration will be dominating the agenda as the populations will have seen the downsides of isolationism and protectionism. Supply chains will remain largely intact.
- 3) **Neo-sovereignism and protectionism:** Protectionism can be afforded by countries/blocks with a large internal market for goods and services. Hence, the leading world countries will tend to retreat back to pre-

liberal trade policies with more active use of fiscal and monetary measures to increase their competitiveness in global trade. Trade will largely become bilateral or multilateral among only the countries that have essential trade and raw material supply chains. Food production and most of the industry will be repatriated, while state fiscal instruments will be used to mitigate price hikes in countries with the most expensive labour. Political costs will be mitigated by increased nationalistic and self-centred political rhetoric. Existing multilateral structures will continue decaying while military alliances will be preserved in altered forms.

- 4) **Cohabitation+**: co-existence of several trends; selective approach to partnerships, both with regard to regional involvement and interests. This scenario envisages the world in which the pre-COVID-19 relations between countries become more complicated while maintaining some of the existing formats of collaboration and coordination. Global partnerships will become outdated, while multilateralism on regional and even pan-regional level will remain. Collaboration will become selective and regional trade agreements will substitute global solutions like the WTO. Economic and political expansionism will face increased protection from individual regions and countries. The sectors most affected will recover as entertainment (e.g. tourism, cultural events, sports) will also be demanded. Digitalization of services among those with resources and technology will continue. Sharing technologies among closest partners will remain, while restricting access of the others.

The scientific group has concluded that **Cohabitation+ is the most likely scenario in the world post-COVID-19**. In such a scenario the US will continue its efforts to adjust its position in free-trade conditions, and restore the influence of its major corporations in world politics. At the same time, the US will not entirely return to pre-Trump era and protectionist elements in its policy will remain. The EU will seek for global leadership, advancing its role as a pioneer in addressing climate change and an advocate of Sustainable Development goals. At the same time, it will remain lightly reserved to partnerships that do not follow its values of human rights and social and environmental responsibility. The PRC will seek to preserve its economic partnerships with the Western countries while antagonizing them on security matters. The Russian Federation will seek to stay relevant in a world where demand for raw materials is changing, and it will continue to punch above its weight with a complex use of political and military means.

Latvia will thus find itself in the world that is becoming more complex and uncertain. The rule-based world order will no longer be perceived as given and multilateralism in world politics may not be the preferred approach of all countries in the world. In such a scenario, strong EU and NATO will continue to be Latvia's major security guarantees, providing Latvia with international protection, geopolitical allegiance, means to continue growth, and importantly – access to financial resources and technologies. Latvia will have to continue deeper integration into the production chains of the closest EU and NATO partners. As a reliable partner, actively engaging in solving global problems, Latvia will thus follow the path towards rooting Latvia in the Western world that is learning to cohabit with similar power centres in other regions of the world.

The full version of the report (in Latvian) is available on the internet at:

https://www.bvef.lu.lv/fileadmin/user_upload/LU.LV/Apaksvietnes/Fakultates/www.bvef.lu.lv/6.ZINATNE/Instituti/LV_PEAK/reCOVery-LV_Starpt_attist_scenariji.pdf

Summary of sub-project “Restructuring of local agricultural and food supply chains and strengthening of resilience in crisis and post-crisis conditions in Latvia” (WP5)

The **research aims** to develop locally appropriate solutions adapted to post-crisis conditions, that would improve the resilience of local (Latvia's) producers, food supply chains and food ingredient supply chains while also strengthening Latvia's food self-sufficiency and allowing enterprises to prepare to a possible sudden restructuring of food systems during and after the crisis. To achieve the aim, three **main specific research tasks** were set. The research was conducted by 21 scientist and 8 students, from the Latvia University of Life Sciences and Technologies (LLU) and the LLU DPP Institute of Horticulture from 07 July to 20 December 2020.

The **methodological framework** for assessing the resilience of local and global food supply chains during and after the COVID-19 crisis has been developed by employing the **Delphi method**, thereby ensuring the multiple involvement of experts and industry representatives at the various stages of data acquisition and analysis and taking qualitative and quantitative measurements that allow the analysis to be deepened successively at each stage.

Summary of the project's results

1. The resilience of local and global food supply chains during and after the COVID-19 crisis

International experience in dealing with the impacts of COVID-19 on the food sector

An examination of reports by international organizations and foreign media, consumer behaviour studies and online materials from food companies on the impacts of the COVID-19 pandemic on global food systems revealed that many economies had a recession due to measures taken to stop the spread of the coronavirus. In the short term, ways should be found to limit the spread of the pandemic. A general examination of food systems in the context of the COVID-19 pandemic suggests that the effects of COVID-19 on the supply of, demand for and access to food are interlinked and affect food systems in a complex way. Disruptions in supply chains affect both the pattern of supply and demand, while economic difficulties affect individuals' access to food, which in turn affects the overall demand for food and decision-making in supply chains. **Situation in Latvia during the COVID-19 pandemic**

The research study revealed that **during the emergency situation, the demand for food products manufactured in Latvia decreased in both the domestic and export markets**, and this problem was also exacerbated by the dependence of the sectors examined on exports, as well as food imports. Because of the decrease in the sales market, the stocks of manufactured products increased for some companies in the sector, their turnovers and, consequently, revenues decreased. The mentioned problems, together with the higher cost of implementing anti-pandemic measures, re-planning logistics and covering additional costs, **created cash flow problems**. The COVID-19 crisis reconfirmed the dependence of the sectors examined on the physical presence of labour at companies and exacerbated the problem of labour availability, as well as created difficulties in planning future economic activities under the conditions of uncertainty in the market.

Cereals and legumes

As regards production volumes, producers of cereals and legumes are optimistic, as the demand for basic raw materials in the food sector will always remain steady, but if the grain exports are disrupted, the situation in the sector might deteriorate dramatically. Producers are also significantly dependent on imported raw materials, as most fertilizers and plant protection products are imported into Latvia. If the crisis does not lead to a deterioration in the supply of raw materials needed for production, producers of basic food products are able to supply a quantity of products that is three times the needs of consumers in Latvia. The largest problems might emerge for food processors who produce snacks that are less in demand during the crisis, or whose products are consumed to a large extent by the HoReCa sector, which stopped the operation during the crisis. Overall, processors are flexible and adapt to the challenges caused by the crisis through developing new products, seeking new outlets if necessary, reducing their outputs and producing their products according to the market demand. However, the dependence of the food industry on imported raw materials and export markets affects several critical areas that become apparent in the event of a deepening crisis: insufficient storage capacity for finished goods and raw materials, as well as availability of working capital for building up stocks of raw materials necessary during a crisis and meeting obligations in case of a decrease in revenue.

Potato

The risks identified in the first wave of the COVID-19 crisis related to changes in demand, which affected potato producers to various extents, depending on the type of potato marketing. During the first wave of the crisis, potato processing companies assumed the risk; therefore, potato producers that supplied potatoes for processing were not

affected. The demand for fresh potatoes did not decrease, yet the potato price decreased because the market was overflowed by potatoes for processing from neighbouring countries, companies of the HoReCa sector stopped their operation and exports of organic potatoes stopped as well. The COVID-19 crisis also significantly affected the potato processing industry, as traditional consumers of processed potato products stopped their operation because sporting and cultural activities were banned, the HoReCa sector was closed and opportunities for exports of potato starch decreased.

Horticultural industry

Given the great interest in keeping small gardens during a pandemic, which allows individuals to meet their needs for fruits and vegetables during the summer-autumn season, producers should plan their production process so that a part of their production enters the market in late autumn and is available longer in spring. It is necessary to increase the capacity of processing horticultural products. The modernization of storage facilities and the construction of modern winter greenhouses would be an important contribution to solving this problem. A reduced VAT rate is essential for the development of horticulture. Competitiveness could be boosted by introducing the certification of products, thereby providing more market opportunities for large chain stores and decreasing dependence on imports. To balance prices on food and avoid higher costs due to certification, it is recommended to make the certification voluntary for national companies and set mandatory certification standards for imports, especially from third countries. However, for the purpose of supporting domestic horticultural producers, it is recommended to introduce an integrated or organic farming certificate in addition to the certification certificate. Such an approach would significantly reduce the differences in price between imported and domestic horticultural products.

Milk and dairy products

During the COVID-19 pandemic, the demand for industrial dairy products decreased significantly, with the demand recovering at low prices. Therefore, the price of milk in Latvia during the crisis decreased on average by 9%, while some producers lowered it even by 12-15%. During the pandemic, the milk processing companies that were negatively affected the most were those that focused on: 1) the production and sales of short shelf-life products (milk, kefir etc.) for the HoReCa sector (about 10% of the supply); 2) the production of long shelf-life products (skimmed milk powder, butter, hard cheeses) because the demand for such products in export markets decreased, and the products were stockpiled in warehouses and their cost increased. All processing companies incurred additional costs to meet epidemiological requirements, as well as logistics costs increased because it was difficult to deliver products across borders. Processing companies did not make practical use of the support measures provided by the government because the companies had no downtime and made efforts to continue the production process, while the intervention measures imposed at EU level were ineffective. Additional subsidies of EUR 12.5 million were granted to dairy farmers to stabilize their revenues, as well as direct payments were paid in advance and interest rate subsidies were available to the dairy farmers. Producers and processors have to build up 1-3-month stocks of raw materials and other supplies. In order for the food industry to overcome the impacts of the crisis, a clear response programme with potential support measures, measures to support exports and domestic consumption, a reduced VAT rate on basic foodstuffs, easier access to working capital, a transport and goods corridor inside and outside the country, more coordinated investment support and a “farmer replacement” programme are needed during the crisis.

Meat production and processing

The COVID-19 crisis is a new challenge for businesses operating in the meat sector. Interviews with meat production and processing companies show that in the short term, the companies were able to overcome the difficulties caused by the crisis at the company level by means of various solutions specific to the company, while in the long term the operation of some companies could be jeopardized. This particularly relates to the pig industry, which has been significantly affected by the spread of African swine fever. During the COVID-19 crisis, the most significant risks for meat production and processing companies were associated with the fact that their cooperation partners temporarily stopped operating, as well as the inability to adapt to the new hygiene requirements. Since the time for proper fattening of animals/poultry is limited in meat production, the inability to sell the product during the right period creates significant burdens – both unnecessary costs and a lower quality of the product. The risk for meat processing companies operating in the HoReCa sector is also very significant, as deliveries of their products were interrupted or significantly reduced during the COVID-19 crisis. The demand also decreased in the export markets and in the HoReCa sector because the cooperation partners temporarily stopped operating.

Eggs and egg products

An assessment of the situation in the production of eggs and egg products reveals steady development of the industry in the country, and in order to ensure egg and egg product supply chains are operational in crisis and post-crisis conditions and manage internal and external risks of the crisis, a set of the following measures should be implemented: various national social support and cooperation programmes and guidelines for producers on response to the crisis have to be developed, national institutions has to support producers in finding export markets, there have to be “green” corridors for food, raw materials and packaging at borders, as well as national financial support to producers and producer partners affected by the crisis as well as to households to stimulate their consumption has to be provided. It is also necessary to stimulate the loyalty of consumers to domestic products, as well as to include eggs in school menus. The competitiveness of the sector could be raised by reducing the impacts of imports and the VAT rate on food. Producers, however, in cooperation with universities and research institutions, need to work on innovative solutions regarding packaging and new products, as well as on poultry breeding in the country. If, in a crisis, national borders were closed and the flow of goods and raw materials were not restored in the long term, then, after a year and a half, large-scale egg production in the country would stop because all breeding material is imported.

Fish harvesting, aquaculture and processing

The Covid-19 pandemic affected fishing and processing companies differently. The fish processors producing various products in addition to canned fish experienced problems with the supply of raw materials, which were mainly delivered from abroad and often from non-EU countries. Processors faced a significant decrease in the demand for short shelf life products. Due to the pandemic, both the domestic and foreign demand for long shelf life products increased. Given the growing demand, companies were able to use their previously idle production capacities. In 2020, most fish processing companies were able to remain operational and meet the growing demand. Nevertheless, the situation remains risky, as canned fish (mainly traditional canned fish made from local inputs (small pelagic fish species)) is almost non-mechanized and requires a large number of workers, which increases the risk of rapid spread of the virus. The demand for fresh or chilled fish decreased, whereas the demand for frozen fish increased. The positive balance of finished canned products has also increased (more is exported than imported). The main specifics of the crisis (supply chains get longer, potential markets are closed): 1) growth in demand for longer shelf life products; 2) preference for frozen fish over fresh or chilled fish; 3) decrease in the output of more expensive fresh salmon products; 4) decrease in the production of fresh or chilled food.

Retail sales and consumption

The emergency situation imposed in response to COVID-19 in the spring of 2020 had a significant impact on the HoReCa sector and the food retail sector, which experienced steady growth in recent years. Companies operating in the HoReCa sector experienced a 70-90% decrease in turnover in March. The companies had to quickly shift to other forms of marketing, such as home delivery, yet overall, the situation gradually started improving in the summer of 2020. In the food retail sector, the changes were due to a change in the population’s shopping behaviour (increase in consumption in March, followed by a decrease in April), yet the losses suffered by companies of this sector were not as significant as those suffered by HoReCa companies.

E-commerce services expanded significantly owing to closed foreign borders and remote work, small grocery stores in the regions flourished, as well as several innovations in customer service were introduced. The changes in consumer behaviour during the crisis could be mainly characterized by stockpiling, home cooking, the desire to buy domestic food and new direct food supply chains.

Scenarios for overcoming the potential consequences of the crisis and an assessment of the scenarios for food supply chains

The following key drivers of food supply chains during the crisis and post-crisis period were identified in seminar discussions and interviews: 1) **market demand** for a particular product or the opportunity to sell particular products in the market (domestic or foreign), as the development of most food industries is determined by domestic demand or export capacity. If products are in demand, the companies earn revenues and grow. During the COVID-19 pandemic, the demand for products changed, various obstacles to the production and sale of products emerged, product stocks increased as well as costs increased, which made a negative impact on the food industry; 2) **capability to ensure the production process is uninterrupted**, with the **availability and sufficiency of individuals/employees** at all stages of the food supply chain being the main and most important factor, as production and processing companies need their employees to be physically present at their workplaces since it is not possible to work remotely in the food sector. Any case of COVID-19 in a company could lead to production interruptions, thereby causing losses to the company and affecting the market situation. There could be developed

four scenarios for food supply chains for the crisis and post-crisis period. Besides, the scenarios and the resilience of the food sector during the post-crisis period are determined by the duration of the crisis.

2. The possibilities of providing local agricultural raw materials and food products and develop innovative solutions to improve the resilience of chains in crisis and post-crisis conditions

Assessment of prospects for horticultural supply chains in Latvia to contribute to food and nutritional resilience in crisis and post-crisis conditions in Latvia

An extensive survey of horticultural producers (42 farms and cooperatives of various sizes) was conducted and data from the CSB and the RSS on the horticultural area, fruit and vegetable consumption and horticultural productivity in Latvia were analysed to identify the potential supply of horticultural products. It was identified that exports of fresh fruit and vegetables (only sea buckthorn, blackcurrants, cranberries, blueberries, small quantities of quince, juice apples, beets and garlic) represented an insignificant share of the output of the horticultural industry.

The **periods of availability of fresh fruits and vegetables** produced in Latvia **to the market, households and retail networks** were identified for 19 species of fruits and 26 species of vegetables, which allowed creating an availability calendar for the products. Among fresh fruits, apples are the longest available on farms and in the market (9 months), other fruits and berries are available for 2-4 months, except for raspberries and strawberries, which are grown under cover (5-8 months). Some kinds of berries are available frozen for up to 12 months, yet the quantity available varies from year to year. Some kinds of berries and fruits are available in retail chains even for a shorter period (plums, cherries, pears, gooseberries etc.) and are practically not available in large chain stores. Therefore, the dependence on such product imports is significant. The **availability of vegetables** depends on the type of agricultural production: open field vegetables are available mainly during the growing season or within the storage period, which is long for most root vegetables and cabbage and short for “green” vegetables. During other periods, imported vegetables are available. Vegetables produced under cover are available in Latvia all year round; however, the supply of such vegetables does not fully meet the demand.

An analysis of the results of the survey and discussions **identified the main risks** that could most significantly affect the availability of fruits and vegetables and the supply chains concerned under the conditions caused by a pandemic.

Development of four-week food consumption basket models for preparing hot lunches at home during a crisis and at out-of-school activities in post-crisis conditions

The sub-project **developed a food consumption basket model for preparing hot lunches at home for a period of four weeks**. The model is adapted to the cost of EUR 1.42 per meal, in accordance with national budget allocations for the provision of free lunches for first-fourth-year schoolchildren. The food consumption basket model has strategically combined various support instruments, including the School Milk and Fruit programme, to provide the necessary nutrients for the day. The products for a food package were selected based on whether the products may be stored at room temperature and do not spoil due to inappropriate storage conditions.

The model is based on the recommendations of the Ministry of Health for food security during a pandemic and orders of the Ministry of Health No. 212/24/11/2017 Recommended Energy and Nutrient Intake for the Population of Latvia and No. 202/25/07/2003 Recommendations on Healthy Diets for Children Aged 2 to 18 Years and Recommended Food Intakes. The composition of 4-week food packages was designed, and recommendations on meal preparation (recipes, instructions) were developed, as well as food calculations were performed. The calculations were based on the nutritional values of foods available on the labels or the nutritional values were calculated using the Finnish National Food Composition Database (Fineli). Lunch meals were prepared and tested to establish whether the dishes were tasty and how the dishes were perceived overall. The nutritional parameters of the dishes were tested in the laboratory to determine the contents of protein, carbohydrates, including sugar, fibre, fat, including saturated and unsaturated (mono- and poly-) fats, and trans fatty acids, ash, salt and some essential minerals: calcium, iron and iodine. Based on the parameters identified, the composition of the dishes was enhanced. Recommendations on food packaging were also developed – appropriate materials, their shape and functionality were selected to create a food package.

3. The solutions and recommendations on strengthening the resilience of agricultural raw materials, food products and nutrition systems in times of crisis and post-crisis development opportunities, as well as promote knowledge transfer to stakeholders – policy makers, municipalities, producers and consumers

Proposals and recommendations for various levels were developed:

- Proposals on mitigating the impacts of the crisis, including the need to develop a national crisis action plan, prioritize food production and processing, take measures to boost exports and stimulate domestic consumption and ensure the flow of food products between countries; the proposals relate to the fields of labour relationships, taxation and availability of working capital etc.
- Proposals on improving the availability and effectiveness of current financial support measures intended for crisis situations – it is necessary to compensate for the losses of revenue and higher costs caused by the coronavirus outbreak, including storage costs, to continue making direct payments in advance; several proposals relate to granting investment support, decision-making, providing working capital etc.
- Proposals on increasing the resilience of the food sector and foster post-crisis growth – it is necessary to make a more stable national policy to promote business expansion, national support is needed for encouraging cooperation; both during and after the crisis, an essential factor contributing to the development of enterprises is access to loans and banks' willingness to lend to businesses; greater protectionism for domestic goods, support for domestic market protection, support programmes to increase domestic consumption and exports, support for export-oriented companies, long-term stable tax policies, reductions in VAT rates on foodstuffs, a “farmer replacement” programme etc. are needed.
- Proposals for educational and advisory institutions on how to better transfer knowledge to promote sustainable growth in the production of key agricultural commodities and in the food sector after the crisis – recommendations on educating entrepreneurs, businesspersons and the public and research priorities aimed at increasing the resilience of food supply chains etc.
- Proposals for entrepreneurs and businesspersons aimed at overcoming the uncertainty caused by the crisis in food production and processing, fluctuations in demand, reducing potential problems related to the illness of employees and promoting the development and resilience of the sectors concerned in the post-crisis period etc.

A **curriculum for the course** Restructuring of local agricultural and food supply chains and strengthening of resilience in crisis and post-crisis conditions was designed; the course is intended for LLU programmes and training carried out by the LLU Lifelong Education Centre and Latvian Rural Advisory and Training Centre Ltd. Two research papers were produced and published: *Grinberga-Zalite G.; Pilvere I.; Muska A.; Kruzmetra Z. Resilience of Meat Supply Chains during and after COVID-19 crisis. Emerging Science Journal. Vol. 5, No. 1, February, 2021, pp.57-66. <https://www.ijournalse.org/index.php/ESJ/article/view/422>* *Beitane, I.; Kruma, Z.; Kince, T.; Sabovics, M.; Iriste, S.; Muizniece-Brasava, S.; Bujaka, J.; Strode, S.; Ciprovica, I. Case Study: Free Lunch Meals Provision during the Remote Learning Conditions. Nutrients 2021, 13, 605, 10 p. <https://doi.org/10.3390/nu13020605>*

Publicity activities of the project:

- Four seminars with stakeholders, producers, processors, their non-governmental organizations and policy makers were held; the number of participants was 78 (16/09/2020, 30/09/2020, 14/10/2020, 28/10/2020).
- To report on the project, the researchers involved in the project participated in **one** international scientific conference (6th International Scientific Conference TRENDS IN REGIONAL DEVELOPMENT IN THE EU COUNTRIES 2020 CONFERENCE 23/10/2020. (videoconference) Warsaw (Poland) /Jelgava (Latvia) Warsaw University of Life Sciences and Latvia University of Life Sciences and Technologies) and **three** national conferences (at a general meeting of the Latvian Academy of Agricultural and Forestry Sciences on 11/09/2020; a conference Crop Festival Vecauce-2020. Research during COVID-19 held by LLU on 05/11.2020 and Ministry of Agriculture and Ltd "Latvian Rural Advisory and Education Centre" conference organized by the Fisheries Network “New challenges and opportunities for fisheries” 27/11/2020).

Full version of the report (in Latvian) is available:

https://www.llu.lv/sites/default/files/files/projects/zinojums_partikas%20kedes_VPP_reCOVery_01_2021.pdf

https://www.llu.lv/sites/default/files/files/projects/Zi%C5%86ojums_partikas_pakas_VPP_recovery_01_2021.pdf

Summary of the results of the Latvia's 2020 Productivity Report (WP2)

Full text of Latvia's Productivity Report 2020 (hereinafter 'the 2020 report'), 97 pages in four chapters. Chapter 1 analyses Latvia's productivity studies, productivity factors and trends. Chapter 2 looks at policy to enhance productivity and development scenarios. Chapter 3 develops productivity-enhancing support criteria. Chapter 4 analyses the country's fiscal sustainability. At the end of the report there are conclusions and recommendations to improve policy. Latvia's 2020 productivity report, 30 pages, with attachment containing in-depth study on the facilitation of infrastructure development and efficiency under crisis conditions.

The full version of the 2020 report (in Latvian) is available on the internet at: <https://www.bvef.lu.lv/petnieciba/petnieciba/zinatniskie-instituti/lu-domnica-lv-peak/> and the executive summary (in English) - on the internet at https://ec.europa.eu/info/sites/info/files/economy-finance/lv.ex_summary.2020.en.pdf.

Key results of the 2020 report

1. An analysis of research by international organisations such as the OECD, IMF, the EC, etc., and research by Latvian scientists and researchers and public institutions, shows that research on productivity-related aspects in Latvia is piecemeal and lacks a systemic approach. Most research was done at macro-level, so there is very little research based on company-level data. This limits the scope for drawing up research-based scientific recommendations for the purposes of framing structural policy.

2. Productivity dynamics in Latvia have been fairly rapid over the past few decades, outstripping average growth rates for the EU as a whole. However, compared to the highly developed countries of the EU, Latvia's productivity level still shows a significant lag, which is basically the result of low total factor productivity and significant differences in the quality of production resources (human and capital). In 2019, the productivity level in Latvia was just 49.8% (or 68.8% measured in PPS) of the EU average. Productivity growth rates after the global financial crisis have shown a downward trend. The financial crisis made access to credit harder, hampering capital development and modernisation and investment in modernisation.

3. In 2020, the COVID-19 pandemic had a powerful and lasting impact on the socio-economic situation. However, its impact on productivity is unclear. When calculated productivity by the number of hours worked, this showed that in 2020 productivity in Latvia rose. On the other hand, calculated it in terms of the number of persons employed productivity decreased.

4. The low level of productivity in Latvia's economy is largely determined by the markedly low productivity in manufacturing, itself the result of a number of structural factors. In 2019, high-tech sectors employed just 4% of the total labour force in manufacturing, which is almost twice as low as the EU average. By contrast, the low and medium-low technology intensity sectors accounted for almost 87%, i.e. one-and-a-half times the EU average.

5. The main significance of the increase in the level of productivity is for technological factors, e.g. modernisation of production, the improvement of existing technologies and the introduction of new technologies. Effecting such changes - in terms of raising the overall level of productivity - depends largely on reallocating resources from lower to higher productivity sectors, and to sectors with a more rapid productivity dynamic. The shift share analysis method shows that between 1997 and 2019 in general, the redistribution of labour resources in Latvia to the benefit of productive sectors is not sufficient to have a significant impact on the faster increase in the overall productivity level within the national economy.

6. Latvia's Achilles heel is innovation. In the *Global Innovation Index 2020*, Latvia came 36th out of 131 countries surveyed. On the *European Innovation Scoreboard 2020*, the 2020 edition of a publication published by the European Commission each year, Latvia came 23rd out of 27 EU countries. In the 2019 world competitiveness rating published by the World Economic Forum, Latvia came 52 out of 141 countries globally in terms of innovation capacity. In the assessment of this pillar, Latvia lags furthest behind not just the EU's innovative economies, but also all EU countries with the exception of Romania.

7. Low investment in R&D, low overall innovation performance and an average educational performance are negatively affecting Latvia's efforts to achieve higher productivity. Latvia's innovation performance could benefit from the more active involvement of the larger public companies, which have the resources to mobilise major investment capacity. If there is to be a breakthrough, innovations must be given improved stimulus. Likewise, the legal framework of the innovation system must be improved, particularly as regards the duties and

responsibilities of stakeholder institutions and NGOs and the system of State aid in the creation, marketing and practical implementation of intellectual property. The State must coordinate the marketing of outstanding innovation products in Latvia. The economic foundations must also be laid, and the legal framework established, for the procurement of innovations.

8. The full use of digitisation opportunities is fundamental to the maintenance of productivity. In Latvia, a digital divide has come about between city and countryside. Much of Latvia's population lacks the digital skills needed to make effective use of the internet. The integration of digital technologies in businesses is well below the EU average. Core policies must be to increase digital skills for society as a whole, with a specific focus on each target group, to avoid the risk of future imbalances. An overarching strategy for the digitisation of business must be drawn up. Regulation has an important role to play in the digital economy. Policymakers need to be aware that there are areas where there are limited opportunities to apply new business models, so the challenge is how to create regulatory frameworks when new business models come onto the market. Key structural policies are streamlining in the field of intellectual property rights, new types of employment, international cooperation, particularly as regards taxation of the digital economy, data analysis and the measuring of processes.

9. The supply and quality of labour play a key role in raising productivity. The main directions for improving the availability and quality of the workforce of relevance to Latvia are: solving the issues of demographics and migration, improving access to quality education at all levels, and stimulating reskilling and upskilling. In a bid to promote the development of human capital, a number of reforms have been implemented or initiated in Latvia, though their positive impact on overall productivity levels can only be expected in the medium to long term. There is a need to strengthen the adult education system in order to ensure the transition of the labour force from non-productive to growing sectors. The effectiveness of the adult education system will also play an important role in mitigating the negative effects of COVID-19 and increasing the overall productivity of the economy. Reducing unemployment caused by the COVID-19 crisis is a top priority in the short term in terms of expediting recovery from the recession, helping people return to work and containing the risks of long-term unemployment.

10. A number of studies have shown that the global economy as a whole is expected to change significantly. As new benefits emerge, so too will new developmental directions and innovative products and services. Added to this, the COVID-19 crisis is acting as a catalyst for more rapid change. Global technology trends and new EU policy initiatives will also influence the development of the economy in the future. The expected structural changes are closely linked to an increase in productivity, as it is important to facilitate the reallocation of resources to productive sectors, thereby also increasing the overall level of productivity in the economy as a whole.

11. Given the impact of COVID-19, rapid technological development and new initiatives in the field of climate, public funds must be invested judiciously if economic capacity is to be maintained in the short term and, in the medium- and long-term, the economy transformed. Data currently available (December 2020) suggest that around EUR 18 billion will be available to Latvia over the next 7-8 years. These funds include both the resources available to tackle the COVID-19 crisis, the resources under the current programming period of the EU funds, the national budgetary investments earmarked in medium-term planning documents, as well as the funding scheduled under the multi-annual EU budget.

12. In order to assess Latvia's economic development prospects post-COVID, the development of the national economy as a whole and of basic sectors of the economy have been modelled up until 2030³³. The restrictions created by the COVID-19 pandemic have a negative impact on the economy, but the medium-term economic development challenges already set out in policy planning documents, such as the need to increase exports and productivity of Latvian goods and services, remain unchanged.

13. Latvia's development modelling examines two development scenarios – the trend and the acceleration scenario – and assesses the impact of each development scenario on the dynamics of productivity. In the Trend scenario, current trends are maintained, growth in GDP in coming years (2022-2024) could reach 3.9% annually, but growth rates will slow thereafter to 2.5%. In this scenario, the pre-Covid-19 level (2019) is attained in 2022. The economy, by contrast, takes until 2027 to return to the pre-crisis growth level. Under the Acceleration scenario, which provides for technology-driven competitive edges, efficiency of production, innovation and the ability to

³³To generate developmental forecasts for the national economy, use was made of the Hermin medium-term model drawn up by the authors and adapted to Latvia's economy. This is based on the traditional Keynesian operating mechanism – output depends on both internal and external demand. However, the model also has features of neoclassical theory. For example, production volumes in the manufacturing sector depend not only on demand but also on price and cost competitiveness. Further, demand for factors of production is determined by the function of CES (*constant elasticity of substitution*), where the capital-labour ratio depends on the relative costs of the factors of production.

adapt to exploit the potential of global change, economic growth might peak at 5.3% per annum on average between 2021 and 2024, falling to 3.7% annually for the remainder of the decade. Overall, the calculations show that the deployment of newer technologies, the development of innovative products and services and the broader use of digital solutions and improved process efficiency have a significant impact on the faster growth of sectors and of the economy as a whole. Under both development scenarios, productivity is the main driver of growth. However, a significant factor in ensuring faster growth is also solving labour supply problems. Investment in human capital has a key role to play. It is critically important to provide high-growth and productive sectors with labour, which necessarily means overhauling current adult education programmes and encouraging the labour force to move from less to more productive sectors.

14. Data from the ORBIS base were used to define three scientifically vindicated State aid criteria to promote productivity (one basic criterion and two additional criteria). The first is whether, in the medium term, the company has been able to deliver higher productivity than competitors comparable in terms of size, age, sector and location. This basic criterion ensures that State aid goes to enterprises that are most likely in future to post high productivity. The second (additional) criterion is whether the company belongs to a group of companies with a high likelihood of remaining economically active. Research shows that a greater likelihood of remaining economically active is enjoyed by companies in the manufacturing industry and older companies with more than 10 employees. The third (additional) criterion is whether a considerable portion of economic activity is carried out in areas with high unemployment. The relative importance of these three criteria may change depending on which phase the economic cycle is in. For example, during a period of economic crisis, as the importance of maintaining jobs increases, so too may the importance of criterion number three. Conversely, during a period of economic expansion, the first criterion may assume greater importance. Further analysis is required of the use of other criteria (export capacity, inclusion in an ecosystem, generation of high value added, etc.).

15. The implementation of public infrastructure projects provides a strong impetus for economic activity in the short and medium term, as well as significantly promotes long-term economic development. However, it should be noted that poor project management, incl. planning, selection and implementation pose significant risks to the economy. The analysis shows that, in general, the situation in the Latvian infrastructure sector, due to the specifics of its regulated business, can be described as relatively stable (except for sectors related to physical movement).

16. Priority should be given to infrastructure projects that address the weaknesses of the Latvian infrastructure sector highlighted in the global indexes related to productivity (road quality, high energy prices, water and sanitation standards, online public administration services, ICT access, etc.), as well as limit the main risks related to cyber security, poor project management, extreme weather events, etc. It is also necessary to evaluate the implementation of projects that reveal new potentials, ensuring optimization of the use of existing infrastructure, modern planning and management analytics (digital twins, real-time event reporting, etc.), reduction of transport and monitoring costs (drones, etc.), flexible work organization, efficient support economic value from synergies between different sectors, increasing social value (resilience and crisis management, real-time traffic management, etc.), adding value to environmental protection (electric cars, water and sanitation technologies) and creating new markets (mobility as service, 5G, etc.).

17. In order to identify infrastructure projects that are essential for promoting national competitiveness and overcoming the consequences of the Covid-19 crisis, scientifically based criteria have been developed: productivity criteria, which determine what goal Latvia intends to achieve with the project (for example, improve road quality, increase infrastructure use intensity, etc.); efficiency criteria, the main task of which is to support the selection process of the most efficient and appropriate projects in order to achieve the objectives set by the productivity criteria (for example, evaluation of alternative projects, efficient management, etc.); funding criteria that reflect the priorities for available funding, identifying, as appropriate, funding opportunities for the initiative.

18. In order to reduce the negative impact of the Covid-19 pandemic on the economy, Latvia needs consolidating fiscal expansion: the state investing large financial resources in activating the economy and promoting competitiveness. Latvia's relatively responsible fiscal policy in recent years has strengthened Latvia's position to successfully overcome the Covid-19 crisis. Latvia can still borrow in international financial markets at very favourable interest rates, and Latvia's public debt level is one of the lowest in the EU. The draft state budget for 2021 is conservative, which, considering the suspension EU fiscal rules, allows for more intensive fiscal policy if necessary. Therefore, the risk of endangering fiscal sustainability is relatively low.

19. Although, overall, Latvia's support programme appears modest compared with that of other countries, the study concludes that if we compare State aid intensity with cumulative COVID-19 infection rates in the EU

countries, the Latvian support programme appears to be very proportionate to the spread of the pandemic. Although Latvia had one of the lowest cumulative infection rates in European countries in October 2020, State aid intensity is higher than in countries with significantly higher levels of Covid-19 infection. A comparison of aid intensity versus level of infection shows that German aid is disproportionately high for the spread of the virus, whilst Luxembourg opts for a relatively modest national aid scheme.

20. The crisis has further exposed the inefficiencies of the current EU fiscal framework. Given the rapidly rising public debt in EU Member States and the limited scope for significant debt reduction in the aftermath of the crisis, there is some likelihood that the EU fiscal framework could change in the near future. In such circumstances of uncertainty, as well as considering the highly expansive fiscal behaviour of some Eurozone member states, it may be advantageous for Latvia to pursue a “looser” fiscal policy in 2021.

Summary of the sub-project “Assessment of the impact of remote work on long-term productivity and preparation of proposals for increasing productivity in remote working conditions” (WP2)

Full text of the sub-project *Assessment of the impact of remote work on long-term productivity and preparation of proposals for increasing productivity in remote working conditions* (hereinafter ‘the project’), 30 pages in four chapters. Chapter 1 describes the nature of remote work. Chapter 2 analyses the development trends of remote work in the world and in Latvia, including the potential of telework - how wide and in which sectors/ professions there are opportunities to work remotely. The assessment is based on available statistical information and survey results. Chapter 3 is devoted to the impact of remote work on productivity. Chapter 4 describes in more detail the challenges of remote work and policies to improve the situation. At the end of the study, the main conclusions and proposals for increasing the productivity of remote work are given.

The full version of the project (in Latvian) is available on the internet at: https://www.bgef.lu.lv/fileadmin/user_upload/LU.LV/Apaksvietnes/Fakultates/www.bgef.lu.lv/6.ZINATNE/Instituti/LV_PEAK/reCOVery-LV_nodevums_atta_lina_tais_darbs.pdf

Summary of the project’s results

1. The transformation of the labour market towards more flexible work took place long before the Covid-19 pandemic. Remote work is one of the aspects of labour market transformation that has been accelerated by measures to contain the Covid-19 pandemic, as shown by statistics.

2. Studies show that remote work can increase workers' productivity, reduce costs (such as transport), but it can also lead to isolation and stress as the line between work and home blurs. There are also concerns that the lack of regular meetings with colleagues could stifle creativity and reduce team cohesion. Too much teleworking can reduce employee efficiency and long-term productivity gains. The challenge for the future is to find the optimal balance between teleworking and 'traditional' work. One solution is to have all employees in the office a few days a month. An approach where employees spend a small amount of time developing new ideas with colleagues can be more productive than it used to be.

3. Research on remote work is mainly based on the subjective views of respondents. In addition, there are almost no studies based on statistics. The main challenge in researching the impact of telework is the lack of the necessary "specific" data to strengthen the research base. Thus, for example, it is necessary to improve the accounting of working time by dividing the number of hours worked remotely into the total statistics of hours worked. The availability of such data would increase the quality and objectivity of research.

4. In 2019, in the EU Member States, on average, 14.4% of the total number of employees fully or partially (sometimes) worked remotely. In Latvia in 2019, 3% of all employees worked in full-time mode, but 1.8% in part-time work. Differences in the structure of sectors are one of the main factors explaining the different prevalence of telework in EU countries. Countries such as Sweden, Luxembourg, Finland, the Netherlands and Denmark, where the share of employees in high-tech and knowledge-intensive industries is higher in total employment, are also more widespread. In addition, in the EU Member States in 2019 it differed significantly not only in terms of the share of teleworkers in the total number of employees, but also in terms of whether the teleworking regime was applied in full and in part.

5. In Latvia, as in many other EU countries, during the Covid-19 pandemic, there has been a rapid transition to telework. In the 2nd quarter of 2020, teleworkers accounted for almost 20% of the total number of employees in Latvia. However, as the epidemiological situation improved, their share decreased and in the third quarter alone, 8.9% of employees worked remotely. In the fourth quarter, the share of teleworkers rose again to 18%.

6. The results of calculations performed within the framework of the study show that approximately 38% of employees in the Latvian economy can potentially work remotely. In all sectors, there is a relatively large gap between the number of teleworkers and the potential number of teleworkers. In 2020, the share of teleworkers was almost half as low as potentially possible. Overall, the share of teleworkers in the economy in the nine months of the Covid-19 pandemic averaged 15% of total employment, almost half of the potential number of teleworkers and almost 3 times higher than in the years before the Covid-19 pandemic. However, it is too early to assess what trends the Covid-19 pandemic will cause in the long run. It is not clear whether telework will continue to grow after the crisis and to what extent telework has had a positive effect on productivity during the Covid-19 pandemic, as a sufficient database has not yet been accumulated. In addition, productivity in teleworking during the Covid-

19 pandemic is affected by many other additional factors, such as the psychological condition of employees, school closures, and so on.

7. The main policies for promoting remote work in Latvia:

- develop guidelines (manual) for teleworking. The purpose of the guidelines is to provide an overview of the most important issues to be considered when implementing telework;
- to stimulate investments in communication and ICT infrastructure;
- to develop a comprehensive strategy for the digitization of companies;
- to increase digital skills for the society as a whole, with a specific focus on each target group, in order to prevent the risk of inequality in the future;
- to arrange the legal aspects of remote work;
- improve the framework for data protection to ensure privacy rights and protection against cyber-attacks;
- to develop a new way of public administration communication with private persons - videoconferencing (amendments to the Law on Applications and the Law on Administrative Liability are required);
- promote a change in public attitudes in favour of teleworking through information campaigns, demonstration of best governance practices and highlighting societal benefits. Adapting the public sector to remote work could serve as an example to demonstrate the benefits of telework;
- promote the provision of social support infrastructure, such as childcare (increasing telework without additional policy support to improve infrastructure could increase the burden, especially on women);
- in the long run after the pandemic, telework will affect the supply and demand of the labour market, the regional distribution of labour. Preparing for and adapting to these changes requires anticipatory reorganization of the labour market: labour market forecasting, dialogue between stakeholders and decisions on changes in the structure of the workforce.

8. At the enterprise level, the productivity assessment of remote workers needs to be improved in the following areas:

- development of policies (guidelines, etc.) in the company for measuring labour productivity and remote employee productivity;
- defining key performance indicators and benchmarks;
- use of special tasks or project management software (for example, JIRA, Trello, Asana) to follow the progress of the work;
- use of online time tracking software. For example, HiveDesk automatically tracks how much time employees spend at work;
- determining the execution time for each task. Using estimates and based on experience, a benchmark can also be developed to compare employees working in the same job or in the same team;
- basic productivity metrics should be combined with information on the quality of work, because although it is useful to determine the average time required to complete a particular task or to observe the number of tasks performed per day, it does not give a complete picture of employee performance;
- establishment of a reporting system.

Summary of the evaluation of Latvian enterprises crisis-resilience and solutions for its improving (WP3)

1) Analysis of the companies' financial and economic robustness

Main results of the analysis are to be submitted for publishing in open access journal "Sustainability" in the paper "Corporate resilience prior to COVID caused crisis: Case of Latvia"/ J. Bistrova, N. Lace, L. Kasperovica, the paper is in progress.

The main goal of the research is to analyse the 'screenshot' of Latvian companies' financial health and their preparedness to the crisis conditions. The present research provides an insight into the previous studies about the financial management during the pre and post crisis stages, focusing on financial ratios, based on which the companies can be well-research in the pre-crisis phase and the necessary support can be provided in the timely manner. Additionally, we review available studies on the estimation of corporate bankruptcies during the COVID as well. The review of available research is followed by the methodology and discussion part, which provides an overview of Latvian companies' preparedness to the economic recession and its change during the last five years as well as comparison with status in 2008.

Research Design

Data sample

Based on the data provided by data company Firmas.lv we have built a database consisting of the data for 150000 companies with the turnover exceeding 145 000 EUR since 2007, in order to be able to judge on the long-term development of Latvian enterprises' financial health and, whether, the lessons have been learned. The analysis has been done on several dimensions: 1) within separate industries as financial conditions of the particular industries might be very different from the broad scope; 2) based on the size of the companies as large companies have better access to the resources than the smaller ones, therefore different groups can have different development patterns; 3) based on the region the company operates in as location of the headquarters has also its relevance to the operating results, predominantly because of the two factors: access to talent and access to the financing. Additionally, location might influence logistic processes, access to the consumer market and other important aspects of the firm's activity. The turnover threshold of 145000 EUR was selected to exclude the smaller companies with low number of employees and low turnover as they have negligible influence on the national economy. So, the selected companies provide representation of more than 96% of the aggregate turnover of companies in Latvia, employing almost 90% of total employed in the private sector.

For having a longer history of data and being able to compare the financial resilience of the companies prior the crisis of 2008 we have also used Amadeus database so that we can complement our data sample.

Methodology

We have considered classical ratios used to determine financial resilience of the enterprise such as equity ratio, interest coverage, long-term debt share in total debt and liquidity ratios. Additionally, less widespread, but of no lesser importance three more ratios have been considered as well:

$$\text{Net debt/EBIT} = \frac{\text{Long-term debt} + \text{Short-term debt} - \text{Cash\&Equiv.}}{\text{Earnings before interest and tax}} \quad (1).$$

Sufficient equity was calculated according to the following formula:

$$\text{Sufficiency of equity capital} = \frac{\text{Long-term assets} + \text{Inventories} - \text{Provisions} - \text{Long-term liabilities}}{\text{Equity ratio}} \quad (2).$$

Degree of operating leverage is calculated by dividing operating earnings growth by sales growth:

$$\text{Degree of operating leverage} = \frac{2Y \text{ operating income growth}}{2Y \text{ sales growth}} \quad (3).$$

We have taken 2-year growth in turnover and in net profit to smoothen the effect of non-recurring earnings, which might appear on the company's profit and loss statement.

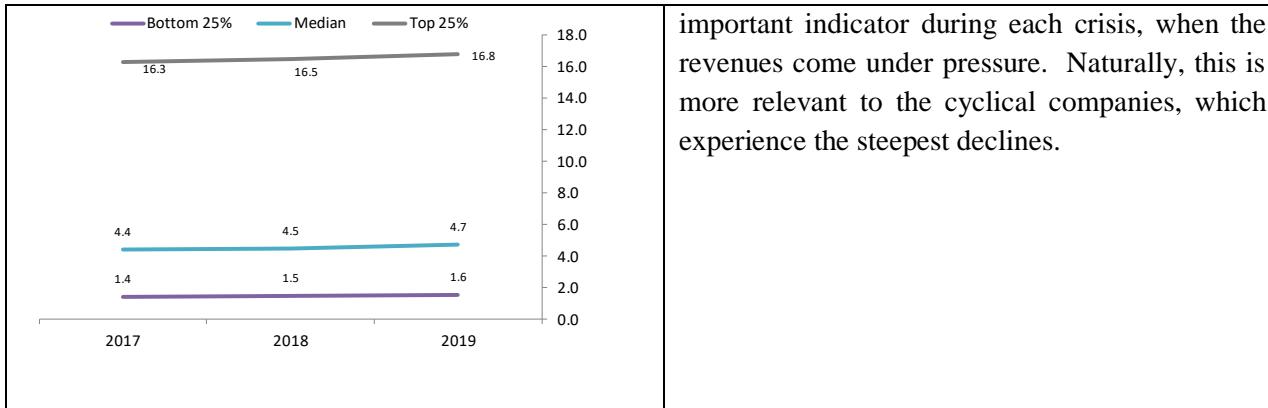
Results and Discussion

The analysis was made in three directions: a) competitive advantage and crisis resilience (Margins, Capital Returns and Operating leverage have been analysed); b) strength of the balance sheets (Liquidity, Interest coverage,

Amount of debt to earnings, Equity sufficiency and Financial stability have been analysed) and c) lesson learned during the past crisis. It was imperative to look at the behaviour of the companies after the financial crisis of 2008, whether the lesson on the business sustainability have been learned and whether the companies have made certain adjustments with regard to their capital structure management.

Table 5.1 Example of results: margin, operating leverage

Gross margin	In general, we see a positive trend with regard to the margin improvement attributable to all level. Particularly steep improvement in profit margin is well-seen in the period of 2018-2019, encouraged by the tax legislation. The diversity in margin levels among sample companies is significant: most profitable companies have net profit margin above 14%, while the median sample level is slightly above 4%. It is worth noticing that the difference between operating margin and net profit margin levels is negligible for all quartiles indicating that the majority of companies have relatively low interest expense and income tax expenses.
Operating profit margin	Highest operating profit margin is observed in three industries: mining/quarrying, financials and real estate. They are followed by agricultural industry, IT and professional service providers. The lowest margins are produced by the accommodation and food service companies, transportation industry and wholesale and retail industry. It is very typical, however, for the latter to have low margin business. Low margins usually indicate very high competition in the industry and lack of competitive advantage.
Net profit margin	On the regional dimension, we see that the highest margins are generated by the companies located in Riga, while the lowest ones are earned by the companies located in Latgale. Micro-companies as a rule have the highest earnings margins as compared to the larger companies.
Operating leverage	Degree of operating leverage is a proxy to the company's riskiness level in its good and bad sense: when the sales base is expanding, the company is able to grow its income at an even higher pace; when the revenues are shrinking, the company experiences even faster decline of net income. The key of defining company's leverage level is the amount of fixed costs, the higher they are, the higher operating leverage. So, it is very



Conclusions of crisis-resilience assessment: The overall crisis-resilience of an average Latvian enterprise can be determined at the moderate level. It is being positively influenced by rather limited dependence on the borrowed capital, low debt servicing expense relative to the earnings ability and decent efficiency of capital management. On the negative side, cash reserves are quite low and can be easily depleted if the crisis strikes. Additionally, the profit margin, which is an indication of the enterprises' competitive advantage and pricing power, is generally on a low level, therefore, making the companies more vulnerable in case of economic downturn that is significantly reinforced in case of high operating leverage. Operating leverage, being on a high level, as in case of Latvian companies, prompts about high fixed cost amount, which can send the company, affected by economic cycles, in troubles at the worsening economic conditions or at demand absence common during the lock-downs. Certainly, the most affected industry is accommodation and food service companies, which are not only characterized by the cyclical nature, but also have poor financial conditions as compared to other industry sectors.

2) Evaluation of Latvian companies' innovation potential and how it can help in overcoming crisis (enterprise-based total factor productivity) *Main results of the analysis are to be submitted for publishing in open access journal in the paper "Enterprise Productivity, Financial Performance, and Innovation Potential"/J. Bistrova, N. Lace (the paper is in progress).*

According to the Solow model, economic development of a country is spurred by investment in capital and labour, and a combination of other factors known as total factor productivity (TFP). However, investment in capital and labour may explain just less than a half of economic growth. However, in recent years, when knowledge and innovations are becoming particularly important, intangible assets often appear to be more valuable than tangible assets, and when the world is on the verge of the next industrial revolution termed Industry 4.0, attention to the role of TFP in contribution to economic growth continuously increases.

The research is structured as follows: first, the authors provide an overview of the existing theoretical and empirical research on the relationship between TFP and financial position of a company and its innovation potential. Further, the authors describe research methodology, as well as data acquisition and processing procedures. The empirical analysis section presents research results on TFP dynamics, TFP levels by region and by industry, as well as analysis results obtained when evaluating the relationship between company TFP and its return on capital. In the same section, the authors reflect on the results of analysis of the most productive companies. analysis ends with conclusions.

Research Methodology

Sample Data: The authors used the data on private and public enterprises from the data base *Amadeus*. Financial enterprises were excluded from the sample due to the different financial reporting structure. Calculation of TFP indicator for one period requires at least two years, thus company TFP indicators were evaluated starting from 2010. The authors selected companies with available data on gross profit, total assets, employee number, tangible assets (PP&E), depreciation, capital investment. In order to evaluate company productivity, company's added value was taken as the basis, which essentially may be broken down into its gross profit (output – y), employment (labor – l) and physical capital (capital – k). Firm-level data were supplemented with the Central Statistical Bureau of Latvia data on the deflator (price index) that was applied to company's added value and investment in physical capital. Within the research framework, the companies were also classified by industry and by region they operate in.

Calculation of TFP: Manufacturing function based on the Solow equation (1957) that the authors use to calculate TFP is expressed as follows:

$$y_{it} = \beta_0 + \beta_k k_{it} + \beta_l l_{it} + w_{it} + \varepsilon_{it}, \quad (1)$$

where y_{it} is company's i added value (here assumed as gross profit) logarithm for period t . Independent variables, k_{it} and l_{it} , are labor (number of employees) and capital (fixed assets) logarithms. w_{it} is company's i productivity during period t . ε_{it} is a statistical error.

We used the methodology for calculating company's TFP suggested by Olley and Pakes (2016).

Methodology of Analysis: The authors initially assessed TFP indicators by region and by industry in order to determine logical patterns depending on the region and industry, where a particular company operates. Categorization by industry was based on NACE 2 classification. Categorizing the companies by region where they operate, the geographical regions of Latvia were considered: Latgale, Vidzeme, Zemgale, Kurzeme and Riga. In order to determine the relationship between company's TFP and their capital efficiency, quartile analysis of TFP indicators was performed with regard to the following company performance indicators: 1) sales/total assets; 2) Net Income/own equity.

Analysis of the Most Productive Companies: Having performed a general analysis of the market in the considered period, the authors selected the companies that demonstrated the highest average TFP indicator in the reviewed periods. The following selection criteria were used: TFP indicator should not be lower than 25%; the company should be large in terms of its revenue, i.e. it should be ranked among thousand largest enterprises.

Conclusions.

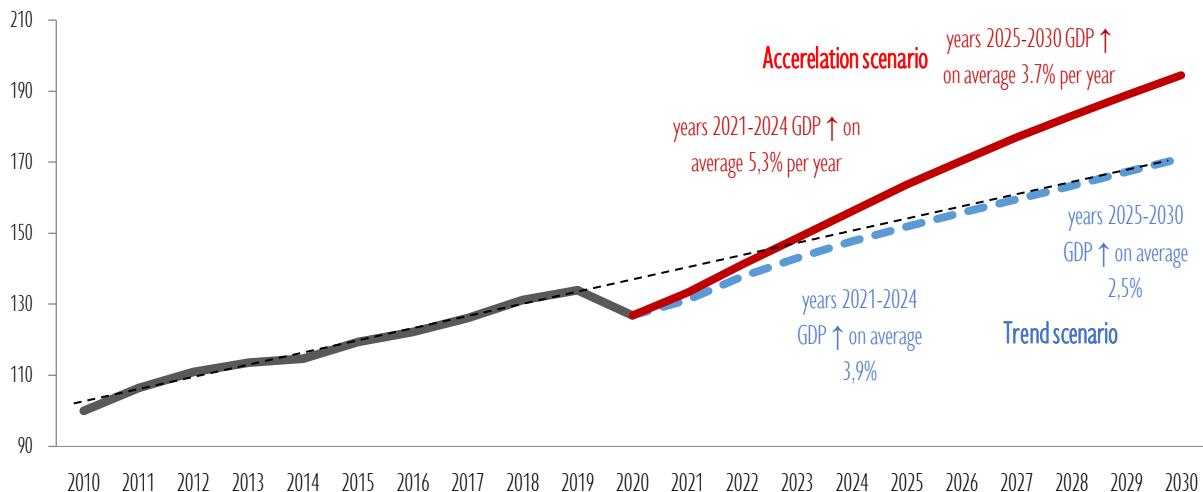
1. We conclude that the significance of the total factor productivity for the Latvian companies is growing, since the role of such factors as labour and capital tends to diminish.
2. Considering the results of company productivity analysis by region, it may be concluded that statistically significant difference between regions has not been observed.
3. Relating the obtained TFP indicators with company capital management efficiency, we conclude that enterprises with high productivity continuously demonstrate better return on equity.
4. It is too early to draw any conclusions with regard to the relationship between innovation potential and TFP on the Latvian scale, as entrepreneurs have just started to recognize the role of innovations.

Basic assumptions of economic growth future scenarios (WP2)

FACTORS	TREND SCENARIO	ACCELERATION SCENARIO
EXTERNAL ENVIRONMENT	Productivity grows according to previous trend	Investment and state support promotes higher productivity level
COVID-19 IMPACT	Spread of Covid-19 comes in waves till effective vaccine is deployed. Situation normalizes at the end of 2021 Most affected industries recover slowly. Reaching pre-crisis output levels might take few years. Economic transformation process is slow.	Spread of Covid-19 comes in waves till effective vaccine is deployed. Situation normalizes at the end of 2021 Enterprises look for solutions to reorient economic activities from damaged industries to new niches of entrepreneurship. E-commerce accelerates
INVESTMENTS, TECHNOLOGIES	Investments in existing business models	Elastic employment forms remains Investments to reduce productivity gap with technologically more advanced countries. Investments also in improving business processes.
INNOVATION, RESEARCH	Investments in innovation and research still increases at low pace. Latvia keeps the existing weak position among EU countries.	Financing for research and development increases substantially reaching 1.5% of GDP in 2027.
DIGITALIZATION	Initiatives of selected enterprises continue (5G, genes, smart city), but the gap between those enterprises that are the digital technologies leaders and those that are slow to embrace digital solutions increases.	Share of enterprises own research expenditure increases. There is continuous process of introduction of digital technologies – in accordance with each enterprise digital maturity. New products and new market niches are created.
GREEN COURSE	Latvia imports green technologies to meet environment requirements	Timely change of course and preparation for the change. Searching for new business niches for green technologies production and export.
HUMAN CAPITAL	In the medium term labor supply and demand mismatches continue to grow Population involvement in life learning keeps at 7-8% level. Market is dominated by relatively short term training to increase general competencies.	6-9 months long state subsidized training programs to prepare labour for industries with high level of development potential. Digital technologies training offered to all groups of society to prevent increase in inequality risks. Active involvement of employers in raising the competencies of existing employees, as well as creation of new skill sets so that people can qualify for new professions in the conditions of economic transformation and robotics.

Latvian economy growth scenarios

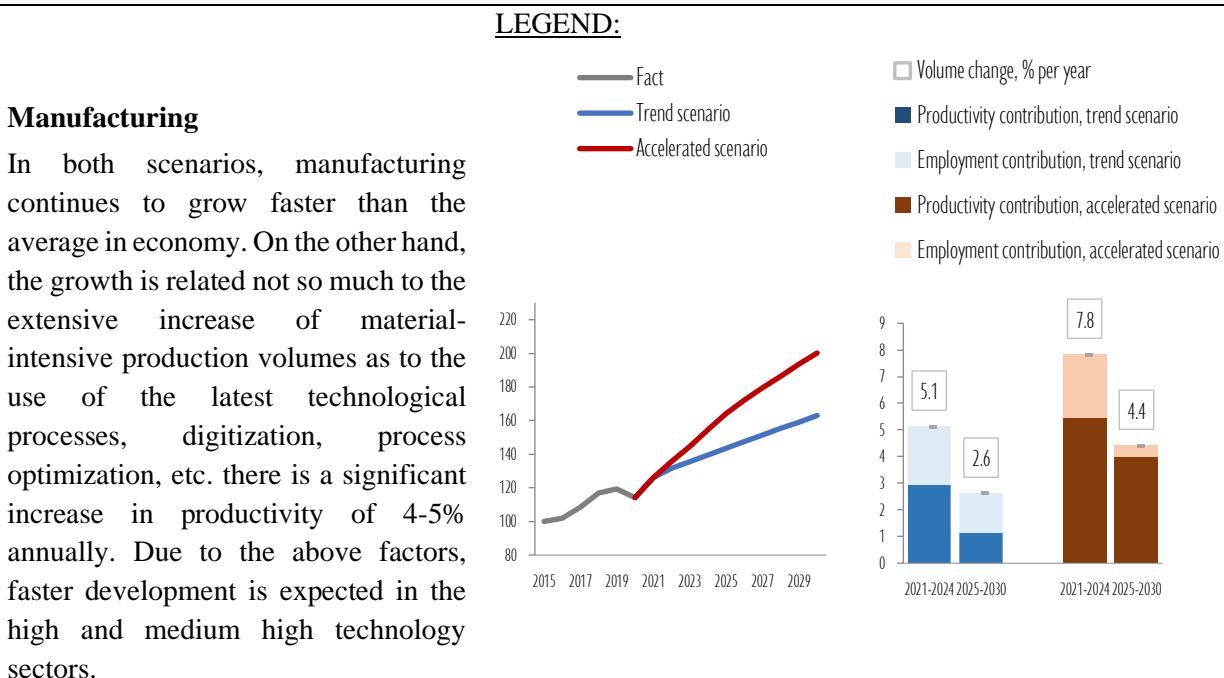
(GDP comparable prices, years 2010=100)



Source: CSB, author calculations

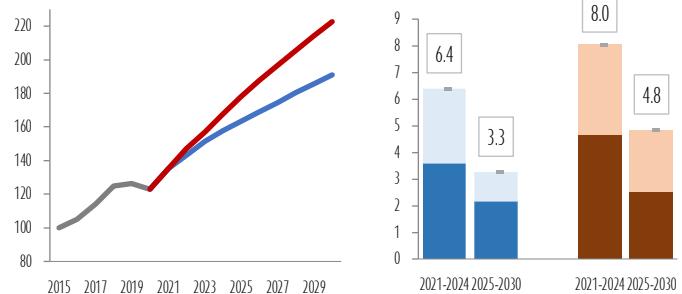
Trends in Latvia's economic growth scenarios by sectors

Sectoral growth tendencies	Change in values added. Year 2015=100	Productivity contribution to sectoral growth
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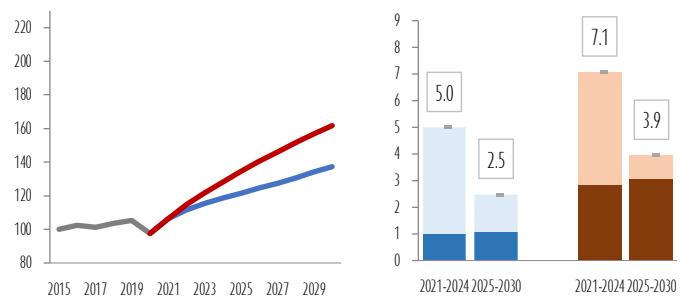
Information and communication technologies

In the IT sector, the fastest growth is expected in the medium term, while productivity growth in the accelerated growth scenario will be more moderate than in manufacturing. The contribution of the productivity growth of the ICT sector to the overall productivity growth of the national economy will be smaller, taking into account the relatively small share of the sector in the structure of the economy. The accelerated growth scenario also maintains a large contribution of labor to growth, which is related to the current labor shortage in the IT sector.



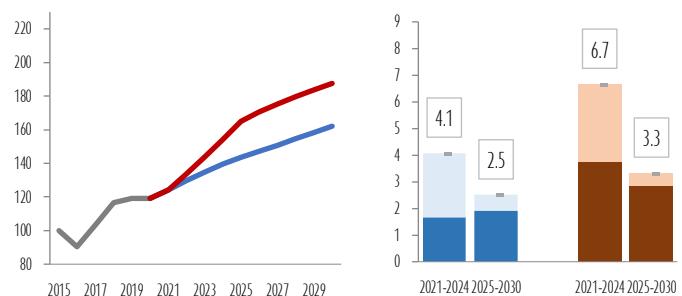
Other commercial services of the market sector

Relatively successful development is also expected in the commercial services sectors, but at the same time productivity dynamics will be moderate. Returning to pre-crisis levels, employment growth will make a greater contribution to the sector's growth. At the same time, it should be noted that the development of the commercial services segment will be very different, for example, the tourism industry is likely to take 3-4 years to reach pre-crisis levels.



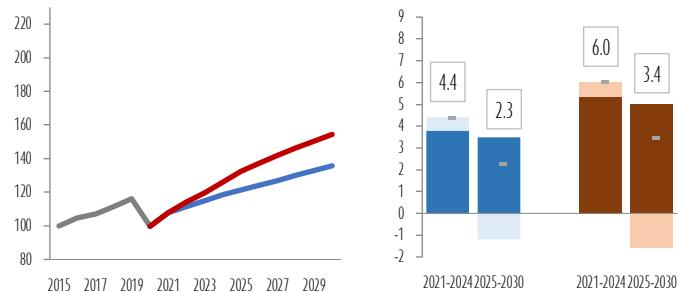
Construction

Stable growth is expected in the construction sector, which will be facilitated both by the implementation of public investment projects (for example, Rail Baltica) and the need to gradually renew the current housing stock. In the medium term, the development of the sector will be closely linked to the ability to increase productivity.



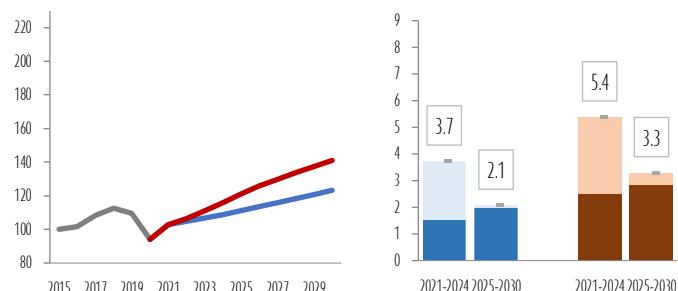
Trade

Trade is currently a labor-intensive sector, but the sector is expected to grow relatively moderately in the coming years, which will be more dependent on changes in demand. The number of employees in the sector will decrease in the medium term. By expanding the use of e-commerce solutions in the industry, the demand for manual work will decrease and most of the industry's growth will be provided by productivity growth.



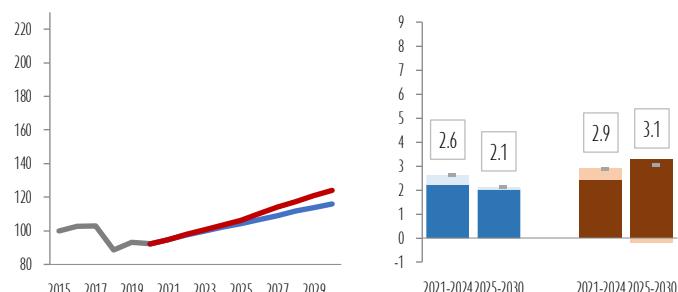
Transport and storage

The recovery of the sector from the crisis will be relatively long (aviation), difficulties in the transit sector will continue. Taking into account the base effect, the total volumes of the sector will increase in the coming years and the largest contribution to the growth will be the increase in the number of employees, while the contribution of productivity will be much more moderate. Faster growth of the industry can be achieved by significantly changing the structure of the industry.



Primary sectors

In the sector, which includes agriculture, forestry, fishing, mining, energy, water supply, waste management, a very modest increase is expected in the coming years. Labour attraction will also be low, and the overall development of the sector will be closely linked to productivity.



Source: CSB, author calculations

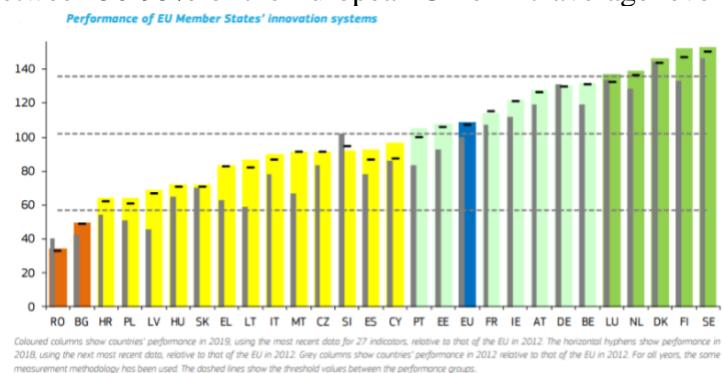
Summary of the sub-project “Innovation trends and proposals to boost innovation in times of economic crisis” (WP2, WP3)

Full text of the sub-project *Innovation trends and proposals to boost innovation in times of economic crisis* (hereinafter ‘the project’), 83 pages in four chapters. Chapter 1 describes the role of innovation in economic growth. Chapter 2 analyses innovative behavior of companies in the context of the Covid-19 crisis. Chapter 3 is devoted to innovation procurement concept. Chapter 4 provides comprehensive analysis of the innovation procurement perspectives in Latvia. The conclusions and recommendations are provided to facilitate innovation and improve innovation procurement in Latvia. The full version of the 2020 report (in Latvian) is available on the internet at:

https://www.bgef.lu.lv/fileadmin/user_upload/LU.LV/Apaksvietnes/Fakultates/www.bgef.lu.lv/6.ZINATNE/Instituti/LV_PEEK/Inovaciju_attistibas_tendences_un_priekslikumi_inovaciju_veicinasanai_ekonomiskas_krizes_1aika.pdf

Key results of the project

Chapter 1 (*Innovation and economic growth*) describes the role of innovation in economic growth, the challenges of the EU and Latvia in promoting innovation during and after the *Covid-19* crisis, as well as EU and OECD recommended good practices and policies. In 2019, Latvia was ranked 23rd in the competition of European Union Member States, stepping up by one place compared to the results of the 2018 survey, while maintaining its place in the group of “average innovators” whose performance in the field of innovation is between 50-95% of the European Union-27 average level.



Source: <https://ec.europa.eu/docsroom/documents/42981/attachments/1/translations/en/renditions/native>

Chapter 2 (*Innovative behavior of Latvian companies in the context of the Covid-19 crisis*) analyses innovative activities of Latvian enterprises during crisis, driving and disrupting factors for innovation. The evaluation was based on the available statistical information, interviews with experts and two surveys conducted by the researcher team. The survey shows that ~ 39% of companies participated in survey implemented innovation during crisis.

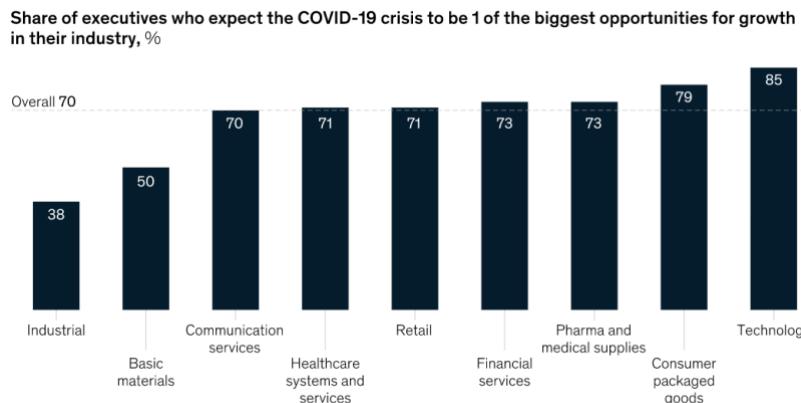
Share of companies implemented innovation during crisis

	All companies	Micro companies	Small companies	Medium companies	Large companies
Development or deployment of new products, processes or services	38.92	27.56	35.04	40.42	42.68
EU	41.55	27.23	33.93	41.42	47.6

Source: results of WP3 survey; LV, EIBIS 2020 (<https://www.eib.org>)

Chapter 3 (*Innovation procurement concept, nature, potential and experience of innovation procurement in other EU countries*) analyses in detail pre-commercial procurement and innovation procurement as well as the experience of other countries. In April 2020, McKinsey conducted a study identifying the

development of innovation in the context of the *Covid-19* crisis. The impact of *Covid-19* crisis on the technological change, consumer behavior and medical sector is seen as the biggest driving source and challenge of the future growth.



Source: McKinsey Innovation through Crisis Survey, April 2020

Chapter 4 (*Covid-19 crisis: Opportunities, barriers and risks to innovation procurement*) of the project are devoted to the procurement of innovation. The research team examined the nature of public procurement, the experience of Latvia and other countries, the potential for public procurement, as well as opportunities and barriers. Centralisation of procurement would reduce costs and should be used by Latvian public procurement agencies. Latvia has the potential for centralisation of procurement at municipal level, when several municipalities merge into public procurement in order to reduce the costs of one purchased unit.

Conclusions and recommendations are split in three dimensions:

1. General conclusions

Various innovation indexes and composite indicators of innovation level and dynamic in Latvia show that Latvia is lagging behind majority of the EU member states and advanced OECD countries. Taking into account numerous EC (European Semester) and OECD recommendations to urgently stimulate innovation in Latvia, the research team concludes that facilitating innovation is the key in increasing productivity, competitiveness and economic growth. The R&D is chronically underfinanced, the public support and private sector involvement is necessary to close the gap.

2. Strengthening innovative behaviour of companies

Even during crisis many enterprises in Latvia implemented innovations. The research team has identified the driving factors and weaknesses of innovative activities. The recommendations include fiscal stimulus, private sector involvement in financing R&D, improving education system to meet labour market needs, etc.

3. Innovation procurement

Increasing demand side of innovation policy in Latvia requires the introduction of an effective innovation procurement program, which can result in higher quality public services in innovation domain with economically justified costs. Effective innovation procurement can help modernise enterprises, primarily young and innovative SME.

Summary of the sub-project “Development of E-commerce and the Reduction of Paper Document Circulation in the Wake of the Pandemic Crisis” (WP4)

Aim:

- To examine and analyse legal enactments at the national level by identifying laws and regulations of the Cabinet of Ministers that both promote and restrict business in the e-environment (including e-invoices, e-signature, legal enactments that govern data storage etc.);
- To examine the use of e-commerce by Latvian companies and to identify the main obstacles that limit the activities of the companies in the field of e-commerce;
- To analyse communication between companies and the public sector and to find opportunities to reduce the circulation of paper documents and increase the usability of the public services established.

Activities implemented:

- Current legal enactments have been analysed, proposals for the legal enactments have been prepared and their impacts on the development of e-commerce and the reduction of paper document circulation in the public and private sectors have been assessed.
- Current statistics from the Central Statistical Bureau of Latvia and DESI (Digital Economy and Society Index) indicators have been analysed to find correlations and contradictions in the use of e-commerce and public services.
- A survey of companies on the use of e-commerce and the impact of the Covid-19 crisis on it has been conducted.
- A survey of companies and individuals on the impact of telework on communication between national and municipal institutions and commercial enterprises with the aim of reducing paper document circulation has been conducted.
- Expert interviews and discussions with professional NGOs have been carried out to find ways for encouraging companies to use e-commerce and reduce the circulation of paper documents.

Main conclusions:

- The current legal framework in Latvia generally supports and promotes the use of e-commerce in all sectors of the Latvian economy, there are no legal obstacles to the active development of e-commerce in Latvia.
- All future strategic and policy documents are fully focused on ensuring the potential of the digital environment for economic development. The development of a detailed action plan, following the main priorities set by these documents, would facilitate the progress of processes and achieve positive results for development.
- E-commerce in Latvia is developing, especially in the SME sector, with a growing trend. The restrictions of Covid-19 have accelerated the transition to the circulation of electronic documents in the national and municipal institutions that had not actively used them, motivating the private sector to follow this example and use electronic documents.
- The largest obstacle to the use of e-commerce, especially in the SME sector, is the lack of understanding and knowledge of business leaders and executives about the possibilities of e-commerce and the positive performance in business development. In this context, the shortage of specialists in the field of e-commerce should definitely be highlighted.
- Although many companies were completely or partially suspended due to the Covid-19 crisis, digital document circulation and the use of digital signatures have increased by 90% in 2020, with digital signatures registered 5 times more each month than in early 2020.
- The analysis of DESI indicators shows significant backwardness in the service sector, signalling a lack of digital skills in entrepreneurs and citizens. At the same time, analysing the population's Internet use and shopping habits allows concluding that the level of digital skills is higher in the private sector than in the corporate sector. This is at odds with the fact that people do not use their skills in business.
- The transition to digitalization and reduction of paper document circulation at the national level must be one of the issues of strategic development for institutions. During the Covid-19, the number of people working remotely and remotely served has increased, which also has contributed to the development of digitalization and the

reduction of paper document circulation. Institutions having successfully implemented remote processes in the field of digitalization started the processes before Covid-19, finding economic, good governance, etc. effects.

- Institutions such as the State Treasury and the Register of Enterprises have ensured a successful transition to remote services/digitalization of work and the reduction of paper document circulation. Since March 2020, the State Treasury has been servicing customers only in digital format. The Register of Enterprises has also been serving customers only remotely since March 2020 and plans to switch to customer service only digitally in the coming years.
- To support the population for submitting documents in digital format, the National and Municipal Joint Customer Service Centres of the Ministry of Environmental Protection and Regional Development are available (93 municipalities and 122 locations) – the inhabitants are assisted by an advisor and have access to a computer there. The development of digitalization should take into account the experience of the Register of Enterprises – apply a reduced fee for submitting documents in digital format (10% discount for registration) and an additional on-site service fee (EUR 4.0), as well as no additional fee for incorrectly submitted documentation.
- A significant contribution to the promotion of digitalization and the reduction of paper document circulation is expected from the new Accounting Law that incorporates the term “structured electronic invoice” necessary for the progress of a process. At the same time, while providing reports to the audience of entrepreneurs on the provisions applied in the Accounting Law, several trends have emerged during the discussions with experts: 1) issues regarding financial benefits and total benefits when applying digitalization processes; 2) doubts about knowledge and competencies in ensuring proper digitalization processes; 3) questions regarding the attitude of the State Revenue Service in cases in which all the documentation of enterprises will be in electronic format; 4) data security issues in cases where all information is stored electronically; 5) concerns that legal enactments impose an obligation to accept an electronic document, but this is not always the case.
- Latvia has set an e-invoicing standard, it is also mandatory that public authorities must adopt e-invoicing format, at the same time the following trends have emerged in ensuring digitalization processes: 1) entrepreneurs and citizens do not always understand that invoicing in pdf format is not electronic invoicing, nor does a printed, signed and scanned document mean an electronically signed document; 2) in case the delivery channel is an xml file, an e-invoice needs to be downloaded, which takes time, so a more efficient solution is e-invoice delivery channels; 3) at present, Latvia does not offer an optimal platform in which bills of lading could be easily exchanged electronically; 4) development is hindered by the fact that it is necessary to specify the invoice delivery channel in the contract.
- To promote the use of e-invoices, the Information System Development Department of the State Regional Development Agency has developed guidelines, other support mechanisms are being implemented as well. According to the information provided by experts, only about 10% of invoices in Latvia are currently processed digitally, therefore there is large potential for development in this field.

The full version of the report (in Latvian) is available on the internet at:

https://www.bgef.lu.lv/fileadmin/user_upload/LU.LV/Apaksvietnes/Fakultates/www.bgef.lu.lv/6.ZINATNE/Instituti/LV_PEAK/E-komercijas_attistibas_un_papira_aprites_mazinasana_pec_pandemijas_izraisitas_krizes.pdf

Summary of the results of the project “Constitutional and administrative framework for effective management of pandemic and other emergency situations” (WP7)

Full results of the project are outlined in a report consisting of 67 pages and two parts. The first part contains analysis of the constitutional framework on dealing with emergency situations, experience of functioning of constitutional institutions during the pandemic and proposals for betterment of constitutional regulation. The second part of the report outlines the research of the use of videoconferences in communication between authorities and citizens within administrative procedure and the use of videoconferences in the work of local municipality councils. The results of the project are accepted for publication in the Journal of the University of Latvia Law, No.14 (ERIH+) and the Proceedings of the 79th International Scientific Conference of the University of Latvia.

Summary of the project's results:

1. Regulation of special situations in the Constitution is obsolete, as it provides for constitutional regulation only for an exceptional situation, which is related to the risks of unrest and military security, but there is a lack of constitutional regulation for emergency situations caused by other threats. The existing settlement of the emergency situation at the level of laws without connection with the Constitution creates legal risks in matters concerning the restriction of fundamental rights.
2. Within the framework of the existing constitutional legal framework, the state authorities, by implementing effective coordination, have ensured the continuity of the activities of the state functions and legally adequate crisis management.
3. Pursuant to Article 23.3 of the National Security Law, the Crisis Management Council should coordinate the operational management of state threat management and the development of state threat prevention plans of state administration institutions, however, in an emergency the government ministries and institutions.
4. In the comparative context, the unique e-platform developed by the Saeima should be especially highlighted, which has ensured the continuity of the work of the Saeima and the possibility to constantly exercise parliamentary control over the activities of the Cabinet of Ministers. The use of this platform may be allowed as an exceptional solution also in normal circumstances, when it is not expedient to convene a sitting of the Saeima in person. It would be useful to strengthen the basic principles of using the e-platform in the Saeima's rules of procedure.
5. In the long run it is necessary to improve the crisis management mechanism specified in the Constitution, specifying Article 62 of the Constitution, renewing Article 81 and envisaging the right of the Cabinet of Ministers to operatively adopt Cabinet regulations regulation.
6. Although the use of videoconferencing applications in personal communications and performance of duties has significantly increased during the pandemic, the use of videoconferencing between the public administration and private persons has not yet developed. In the conditions of the pandemic, the public administration has used the existing forms of distance communication (written communication and communication using electronic communications (e-mails, telephone)). The decrease in face-to-face communication in the opinion of the population has not significantly affected the ability of public administration institutions to implement their tasks.
7. In the administrative process in an institution, the use of videoconferencing is possible at the hearing stage, as well as is relatively widely used in the administrative process in court. However, there are currently neither technical nor legal instruments to provide an equivalent opportunity to receive synchronous online assistance in the preparation of an application and to submit the application using electronic identification means, equivalent to an oral application. This possibility is significant enough in the opinion of the population.

8. Videoconferencing is an adequate alternative to the on-site reception of visitors provided for in the Law on Submissions. However, in practice this possibility is not provided and the law does not oblige the institution to be reached by videoconference. In the case of administrative violations, the law provides for the use of videoconferencing, but only if the participant in the proceedings cannot be present at the place of hearing the case.

9. The availability and spread of the possibilities created by technologies - videoconferencing applications - and the smart devices required for their use create an obligation for the public administration to create a new form of communication with private persons - videoconferencing.

10. In public administration, videoconferencing can be used already in the performance of certain procedural activities (for example, by hearing private persons in administrative proceedings or in performing procedural activities in administrative violation proceedings). However, the use of this technology needs to be expanded to create face-to-face communication in the digital environment with the possibility to create and sign documents during a video conference (for example, an application for an administrative act).

11. From a legal and practical point of view, the minimum requirements for the functionality of a digital platform equivalent to face-to-face communication are the following: 1) the possibility to perform electronic identification of a natural person; 2) possibility of video conferencing; 3) possibility to create and sign documents; 4) possibility to record image and sound; 5) possibility to register in the queue of visitors; 6) versatility - uniform design, but diverse application.

12. The main benefits of face-to-face digital communication are the potential to save resources for both individuals and public administrations, in particular by reducing the use of paper in public administrations. Amendments to the laws are not necessary for the implementation of the platform in the administrative process in the institution. Certain amendments are needed to the Law on Submissions (to provide an opportunity to submit submissions in the form of a short audiovisual recording and digital reception of visitors), as well as to the Administrative Liability Law (providing for a wider possibility to use videoconferencing).

13. The holding of remote council and committee meetings by videoconference during an emergency situation has not caused significant problems either in the decision-making process or in the exercise of members' rights. However, there is still room for improvement in the use of this technology to make the decision-making process smoother.

14. There are no significant differences in the attitudes of the deputies between the use of videoconferencing in the council meeting and the committee meeting.

15. In the case of remote council meetings by videoconference, it is important to ascertain the quorum of the sitting, including the identity of the deputies present, as well as to record the will of the deputy in the votes. During the emergency situation, no significant problems were identified in establishing these legally important circumstances, although the experiences of local governments have been different.

16. There are no legal or practical obstacles to councils and committees being able to hold remote videoconferencing in certain cases in normal circumstances. This possibility should be an exception in cases where, due to the number or nature of the issues to be discussed at the hearing, it is not appropriate to convene a hearing in person.

17. During the emergency situation, the public administration has continued to perform all its functions, also using forms of telework. The circumstances created by the pandemic and the emergency situation have created more intensive work arrangements or additional responsibilities for most public administration employees, but have hardly led to downtime or the need to reduce the number of employees.

18. The circumstances created by the pandemic and the emergency situation, at least in the short term, have not significantly changed the basic issues of employment in public administration or created challenges that would not

be solved within the existing legal framework. At the same time as the use and experience of telework is increasing, long-term research may be needed into the legal framework for employment relations.

The full version of the report (in Latvian) is available on the internet at:

https://www.bvef.lu.lv/fileadmin/user_upload/LU.LV/Apaksvietnes/Fakultates/www.bvef.lu.lv/6.ZINATNE/Instituti/LV_PEAK/reCOVery-LV_petijums_konst_adm_ietvars.pdf

Annex 13

reCOVery-LV participation with presentations at national and international conferences and seminars.

- Presentation at the online conference “Informatics, International Scientific GeoConference” SGEM 2020, August 20: Vasilevska D., Rivža B. “*Factors of the effectiveness of innovative development of Baltic states in the context of digitalization*”, article submitted and approved for publication.
- Report at the conference “Eiropas Savienības sniegtās iespējas Latvijas ekonomikas atjaunošanai un attīstībai” Association of Economists 2010, 2020, August 27: Šteinbuka I. “*Progress un sagaidāmie rezultāti reCOVery projekta izpildē: kritēriji nacionālo un ES atbalsta sniegšanai*”.
- Plenary presentation at the International online Conference "From Creative Destruction to Creative Disruption" WMSCI'2020, USA, September 13-16: Gaile-Sarkane E., Lāce N. “*From Creative Destruction to Creative Disruption*”, Keynote Address, http://www.iis2020.org/wmisci/program/prog_asynch.asp?vc=1
- Reports at the scientific conference "Bankas mainīgajā pasaule", Riga, University of Latvia, 2020, September 29:
 - Šteinbuka I. Address at the plenary session “*Latvijas Bankas loma tautsaimniecības stabilās attīstības veicināšanā*”
 - Bērziņš G. Introductory report “*Banku Biznesa modeļu izaicinājumi modernajā pasaule*”
 - Balodis R. “*Likumdevēja kontrole banku lietās: parlamentāro izmeklēšanu izaicinājumi un secinājumi*”
 - Danovskis E. “*Regulatoru darbības uzraudzība: tiesu vras un likumdevēja kontroles robežas*”

The conference programme: <http://tzpi.lu.lv/konferences-programma/>

The topics and theses of the speakers: <https://tzpi.lu.lv/referenti-un-temati/>

- Report at the 7th International Scientific online Conference “Whither our Economies’2020” / WOE’20, Vilnius, Mykolas Romeris University, 2020, September 17: Bistrova J., Lāce N. “*Evaluation of Latvian enterprises crisis-resilience and solutions for its improving*”, <http://woe.mruni.eu/full-programme/>
- Information about the project was provided at the general meeting of the Latvian Academy of Agricultural and Forest Sciences, 2020, September 9: Pilvere I. “*reCOVery-LV*”, https://www.llu.lv/sites/default/files/files/projects/partika_recovery_pilvere_11_0_2020.pdf
- Reports at the 13th Jonas Pranas Alekса International Interdisciplinary Scientific online Conference “Development of the State Vision in the 21st Century: National and International Context”, Šiauliai, Šiauliai University, 2020, September 18-19:
 - Česnauske J., Gesevičiene K. “*Changes in employment in the Lithuanian labor market and measures of unemployment prevention in the context of the Covid-19*”
 - Štefenberga D., Sloka B. “*Challenges and Possibilities of Regional Economic Development in Kurzeme region*”
 - Vasiļevska D. “*Development of the digital competencies of the public service employees in Latvia*”
 - Ostrovska I., Rivža B. “*Assessment of the socio-economic changes of the coronavirus pandemic on Latgale region*”
 - Ābele L., Rivža B. “*Is the Green, Circular and Bioeconomy the way to Sustainable Development*”
 - Hohlova V., Rivža B. “*The impact of Covid on unemployment rates in the Baltic States*”
 - Rivža B., Rivža P., Jasaitis J., Kruzmetra M. “*E-commerce as a Consequence of Innovation and the Cause of New Innovations for SMEs: the Perspectives of Latvia and Lithuania*”

http://www.su.lt/index.php?option=com_content&view=category&id=602&lang=lt
- Reports at the scientific conference “XIV IBANESS Congress Series on Economics, Business and Management” Plovdiv, Bulgaria, September 26-27:
 - Brence I. “*Public Financial Support for Micro-enterprises in the COVID-19 Crisis*”
 - Štefenberga D. “*Importance of Local Entrepreneurship in Context of Regional Economic Development*”
- Reports at the scientific conference “New Challenges in Economic and Business Development – 2020: Economic Inequality and Well-Being”, Rīga, University of Latvia, 2020, October 2:
 - Priede J. “*Chair of session “Competition, Productivity and Industries”*”
 - Barānovs O., Skribane I., Barānova D. “*Productivity Trends and Income inequality in Latvia*”

- Skribane I, Broyaka A. “Assesment of the Economic development of Latvia and Ukraine”

The conference programme:

https://bit.ly/NewChallengesinEconomicandBusinessDevelopment-2020_BVEF_LU

- Report at the 18th Annual Baltic Management Development Association (BMDA) online Conference “Multidisciplinary approach in business and education to assure high competitiveness”, 2020, October 15: Barānovs O. “*How to ensure competitiveness today and tomorrow at macro level (national, regional, urban)*”, <http://www.bmda.net/BMDA/members-area/news-from-bmda-members/almau-took-part-in-the-18th-annual-bmda-conference/?searchterm=A%20multidisciplinary%20approach%20in%20business%20and%20education%20to%20ensure%20high%20competitiveness>
- Report at the World Energy Council “World Energy Week 2020” online, 2020, October 7-9: Bogdanova O. “*How to prepare better recovery plans*”, <https://www.worldenergy.org/experiences-events/past-events/entry/world-energy-week-2020>,
- Report at the International Scientific online Conference of the Riga Technical University “Scientific Conference on Economics and Entrepreneurship” (SCEE’2020”), 2020, October 16:
 - Bistrova J., Lāce N., Kasperoviča L.”*Analysis of the Companies’ Financial and Economic Robustness*”,
 - Bistrova J., Lāce N., Oganisjana K., Kozlovsksis K., Kasperoviča L., Ciemleja G., Laizāns T., Zumente I. “*Research on the impact of problems caused by covid-19 on the Latvian enterprises and opportunities for overcoming the negative consequences*”

The conference programme: https://www.rtu.lv/writable/public_files/RTU_scee_2020_programme_en_1.pdf

- Presentations at the 6th International Scientific online Conference “Trends in Regional Development in the EU countries 2020” Warsaw University of Life Sciences and Latvia University of Life Sciences and Technologies, 2020, October 23:
 - Ancāns S. “*Effects of the Global Pandemic on Trade in Agricultural and Food Products in the EU and Selected Member States*”
 - Ostrovska I., Rivza B., Aleksejeva L. “*Challenges of the Latgale region economy development in conditions of the Covid-19 pandemic*”
 - Štefenberga D. “*Structure of Entrepreneurship in Kurzeme Region for Economic Recovery*”
 - Āzena L. “*The impact of the covid-19 pandemic on business in Latvia's economic sectors*”
 - Brencē I., Gudele I. “*Remote work and distance learning: lessons learned during Covid-19 and sustainability paradigms*”
 - Ābele I. “*Blended learning in lifelong adult education concerning the aspects of Covid-19 epidemical restrictions*”
 - Vasiļevska D. “*Organization of remote work in the digital economy*”

The conference programme:

https://www.llu.lv/sites/default/files/files/projects/Program_Conference_TRENDS_2020_0zpdf

- Research presentation at the NORDSCI International Conference 2020, October 12-14: Zvirbule A., Grinberga-Zalite G., Muska A. “*Assessment of business environment development perception under the influence of COVID 19: case of Latvia*”, publication in the conference proceedings BUSINESS AND MANAGEMENT, LAW, POLITICAL SCIENCE book 2, volume 3, pages 19-29, ISSN 2603-4107
- Presentations at the Nordic Association of Agricultural Science international seminar, 2020, October 2: Rivža B. “*The Covid-19 pandemic causes structural change in tourism as an important component of the economy. (Case of Latvia)*”
- Reports at the 15th International Academic online Conference “Social Sciences for Regional Development 2020”, October 9-10:
 - Ostrovska I., Rivža B., Aleksejeva L. “*Covid-19 pandēmijas izaicinājumi tūrismu nozarē Daugavpilī*”
 - Štefenberga D. “*Reģiona konkurētspēju ietekmējošie faktori Kurzemē*”
 - Āzena L. “*Covid-19 pandēmijas ietekme uz uzņēmējdarbību Latvijas tautsaimniecības nozaru griezumā*”

The conference programme:

https://du.lv/wp-content/uploads/2020/10/Soc-zin-region-attistibai_Programma-2020-Copy.pdf

- Reports at the International online Conference “Productivity Dialogue”, Rīga, University of Latvia, 2020, November 25:
 - Barānovs O. “*Produktivitātes dinamika un faktori Latvijā, Covid-19 pandēmijas ietekme*”
 - Krasnopjorovs O. “*Produktivitātes analīze uzņēmumu dalījumā: liecības no ORBIS datubāzes*”
 - Bērziņš G. “*Produktivitātes izaicinājumi pandēmijas un dislokācijas ekonomikā*”
 - Priede J. “*Eiropas izaicinājumi produktivitātes celšanā un pieredze*”

<https://www.bvef.lu.lv/en/research/research/scientific-institutes/university-of-latvia-think-tank-lv-peak/translate-to-english-produktivitates-dialogs/>

- Reports at the Conference “The Impact of Industry 4.0 on Job Creation 2020”, 2020, November 12:
- Brence I., Beizitere I., Gudele I., Rivža B. “*Remote Work as a Tool of Industry 4.0: Challenges Faced by Covid-19 and Future Perspectives*”, <https://fsev.tnuni.sk/konferencia2020/index.php?id=information-in-english>
- Presentations at the Latvia University of Life Sciences and Technologies Conference “Ražas svētki “Vecauce – 2020” Pētniecība COVID-19 ēnā”, 2020, November 5: Pilvere I. “*Vietējo pārtikas kēžu pārstrukturizēšana un noturības stiprināšana krīzes un pēckrīzes laikā Latvijā*”, https://www.llu.lv/sites/default/files/files/projects/vecauce_razas_svetki_05_11_2020_pilvere.pdf, the conference programme: https://www.llu.lv/sites/default/files/files/projects/Vecauce_Seminara-programma-2020-majas-lapai.pdf
- Reports at the Conference “Zivsaimniecības jaunie izaicinājumi un iespējas” 2020, November 27: Šabovica M. “*Vietējo pārtikas kēžu pārstrukturizēšana un noturības stiprināšana krīzes un pēckrīzes laikā Latvijā*”, <https://www.llu.lv/sites/default/files/files/projects/zivsaimniec%C4%ABbas%20konference%202027.11.2020.pdf>
- Presentations at the Latvia University of Life Sciences and Technologies Professor E. Grinovskis annual memorial seminar “DAŽĀDĪBA ZINĀTNES PĒTĪJUMOS”, 2021 January 21:
 - Pilvere I. “*Vietējās pārtikas kēdes krīzes un pēckrīzes laikā Latvijā*”
 - Bite D. “*Mazumtirdzniecības un HoReCa sektoru un patēriņtāju uzvedība krīzes laikā*”
- Plenary session presentation at the 79th International Scientific Conference of the University of Latvia plenary session “BUSINESS. MANAGEMENT. ECONOMICS.”, 16.02.2021., I. Šteinbuka “Towards the Post-pandemic Recovery: Opportunities and Risks of Latvian Economic Development”: <https://www.bvef.lu.lv/petnieciba/konferences/lu-konferences/lu-79-starptautiska-zinatniska-konference/plenarsede/>
- Online seminar by researchers of the Latvia University of Life Sciences and Technologies Faculty of Food Technology, Ciprovič, I. “*Sabalansēts uzturs un pārtikas pakas 1. - 4. klases skolēniem*” 2021 February 18: <https://www.llu.lv/lv/notikumi/2021-02-15/tiessaistes-seminars-sabalansets-uzturs-un-partikas-pakas-1-4-klases-skoleniem>
- Research presentations at the 79th International Scientific Conference of the University of Latvia in special conference session devoted to “reCOVery-LV”, 04.03.2021, 12 reports were presented by project “reCOVery-LV” researchers: <https://www.bvef.lu.lv/petnieciba/konferences/lu-konferences/latvijas-tautsaimniecibas-potenciala-saglabasana-un-konkuretspejas-pieauguma-veicinasana-pec-pandemijas-krizes/>
- Presentation at the 79th International Scientific Conference of the University of Latvia in special conference session devoted to VPP Covid-19 research projects “*Latvijas pētnieku ieguldījums COVID-19 seku mazināšanā*”, I. Šteinbuka “*Towards the Post-pandemic Recovery: Opportunities and Risks of Latvian Economic Development*”, 10.03.2021.: <https://www.youtube.com/watch?v=kUYAoZpPCQY>
- Report at the 12th International Multi-Conference on Complexity, Informatics and Cybernetics: IMCIC March 9 - 12, 2021: Organisjana, K. & Lace, N. “*Putting into action crisis-driven business solutions during COVID-19 pandemic*”. Proceedings, pp. 89-94. <http://www.iiis.org/CDs2021/CD2021Spring/papers/ZA447RJ.pdf>
- Report at the Horticulture conference 2021, Kaufmane, E., Lepse, L. “*Dārzkopības institūta izstrādātie ieteikumi COVID-19 ietekmes mazināšanai augļkopībā*”, 2021. April 22: <http://new.llkc.lv/lv/darzkopibaskonference-2021>; <https://www.darzkopibaskonference.lv/>

reCOVery-LV list of scientific publications.

Nr.	List of scientific publications	Published	Submitted	In progress
Publications indexed in Scopus and/or WoSCC (citation index reaches at least 50 per cent of the average citation index in the field)				
1	Bistrova, J., Lace, N., & Kasperovica, L. (2021). Enterprise Crisis-Resilience and Competitiveness. Sustainability, 13(4), 2057; https://www.mdpi.com/2071-1050/13/4/2057	x		
2	Analysis of COVID-19 caused problems and opportunities impacting Latvian enterprises/ N. Lace, K. Organisjana, J. Bistrova, K. Kozlovsksis, G. Ciemleja, L. Kasperoviča L (is to be submitted in open access journal J. Open Innov. Technol. Mark. Complex in January 2021).			x
3	Kasperovica L., Lace N., 2021. Factors influencing companies' positive financial performance in digital age: a Meta-Analysis. Journal: "Entrepreneurship and Sustainability Issues"	x		
4	Beitane, I.; Kruma, Z.; Kince, T.; Sabovics, M.; Iriste, S.; Muizniece-Brasava, S.; Bujaka, J.; Strode, S.; Ciprovica, I. Case Study: Free Lunch Meals Provision during the Remote Learning Conditions. Nutrients 2021, 13, 605, 10 p.; https://www.mdpi.com/2072-6643/13/2/605	x		
5	Dalija Segliņa, Inta Krasnova, Anna Grygier, Elžbieta Radziejewska-Kubzdela, Magdalena Rudzińska, Paweł Górnas "Unique bioactive molecules composition of sea buckthorn (<i>Hippophae rhamnoides</i> L.) oils obtained from peel, pulp, and seeds by using "solvent-free" approach"/Journal of the American Oil Chemists' Society		x	
Publications indexed in Scopus and/or WoSCC				
1	O. Barānovs, J. Salmiņš, I. Skribāne. PRODUCTIVITY FACTORS AND DYNAMICS IN LATVIA. University of Latvia conference proceedings "New Challenges and Business Development 2021". Web of Science	x		
2	O. Bogdanova. THE ROLE OF INFRASTRUCTURE DEVELOPMENT IN THE COMPETITIVENESS OF A COUNTRY, University of Latvia conference proceedings "New Challenges and Business Development 2021". Web of Science	x		
3	O. Krasnopjorovs, K. Kovalovs. Productivity Analysis of Latvian Companies using ORBIS Database. University of Latvia conference proceedings "New Challenges and Business Development 2021". Web of Science	x		
4	Productivity challenges in Europe during the COVID-19 pandemic, Journal "European Integrations Studies" J.Priede			x

5	Productivity issues in the Baltic Sates during COVID-19 pandemic and development perspectives, Journal "European Integrations Studies", J. Priede			x
6	Šteinbuka I., Barānovs O., Malnačs N., Austers A. "Socio-economic implications of the coronavirus pandemic in Latvia". University of Latvia conference proceedings "New Challenges and Business Development 2021", Web of Science	x		
7	I.Brence, I.Gudele "Remote Work As a Tool Of Industry 4.0: Challenges Faced by Covid-19 and Future Perspectives"/ the International Scientific Conference "The Impact of Industry 4.0 on Job Creation 2020"/ https://fsev.tnuni.sk/konferencia2020/index.php?id=information-in-english ; https://fsev.tnuni.sk/konferencia2020/Zbornik.pdf	x		
8	A.Pilvere-Javorska, B.Rivza "Covid-19 Impact on Banking Sector: Case of Latvia", In: Sustainable economic development and advancing education excellence in the era of global pandemic: proceedings of the 36th International Business Information Management Association Conference, Granada, Spain, 4-5 November, 2020, IBIMA Granada, 8951.-8961.lpp., URL: https://u.pcloud.link/publink/show?code=kZCeIokZrrbe3SiQcHyryACEYOALQ51wpz9X#folder=7802801347 ISBN 9780999855157. Web of Science	x		
9	I.Brence, I.Beizitere, B.Sloka "Public Financing Support Options To Micro-Enterprises For Innovation"/ European Integration Studies/ https://eis.ktu.lt/index.php/EIS/Online ISSN: 2335-8831; https://eis.ktu.lt/index.php/EIS/article/view/26569	x		
10	Gunta Grinberga-Zalite; Irina Pilvere; Aina Muska; Zenija Kruzmetra "Resilience of Meat Supply Chains during and after COVID-19 crisis"; Emerging Science Journal. Vol. 5, No. 1, February, 2021, pp.57-66.; https://www.ijournalse.org/index.php/ESJ/article/view/422	x		
11	Šteinbuka, I., Bērziņa-Čerenkova, U., Sprūds, A. (2020). In the Shadow of the Global Pandemic: Deepening or Shrinking Cooperation between China and the Baltic States? European Studies: The Review of European Law, Economics and Politics 1/7, 45-65.; https://www.ceeol.com/search/journal-detail?id=1241	x		
Publications included in ERIH +				
1	D.Štefenberga, B.Rivža, B.Sloka "Regional Development Issues and Consequences of Covid 19 pandemic- Experience and Ability for remote work." in submission to Journal "Regional Formation and Development Studies", Lithuania, Klaipēda University/ ERIHPLUS; http://journals.ku.lt/index.php/RFDS/issue/current	x		x
2	Ostrovska I., Rivža B., Aleksejeva L., Maksimčika I. "Tūrisma nozares izaicinājumi Latgalē pandēmijas COVID-19 laikā"/ Journal Social Sciences Bulletin , Daugavpils University, 2021., https://du.lv/en/research/scientific-periodicals/social-sciences-bulletin/		x	
3	Balodis, R., Danovskis, E. "The Functioning of the Constitutional Institutions During the State of Emergency" Journal of the University of Latvia "Law", Nr.14		x	
Other anonymously peer-reviewed publications in international journals and publications (excluding conference proceedings)				

1	Pilvere I., Upite I., Muska A., Nipers A., Janmere L. Resilience of Milk Supply Chains During and After COVID-19 Crisis in Latvia, In:Rural Sustainability Reserach		x	
Conference materials - full text				
1	Pētījumu rezultātu par COVID-19 ietekmi uz uzņēmumu uzvedību apkopošana papildu referātos konferencēs, IMIC2021 (marts) Organisjana, K., Lace, N. Putting into action crisis-driven business solutions during COVID-19 pandemic/ Proceedings of the 12th International Multi-Conference on Complexity, Informatics and Cybernetics (IMCIC 2021), 9-12 March 2021, pp, 89-93, ISBN: 978-1-950492-50-3 (Volume II)/ raksts ir publicēts, būs Scopus	x		
2	SOitmC conference (jūlijs): 1) Organisjana Karine, Kozlovskis Konstantins, Andersone Ieva «The Impact of COVID-19 Pandemic on Consumer Behavior»; 2) Ciemleja Guna, Kozlovskis Konstantins «Building financial literacy during the COVID-19 pandemic»; 3) Kasperovica Ludmila, Lace Natalja, Tesarova Mariana «Digital maturity and value capture of Small and medium sized enterprises»; 4) Lace N. "Crisis-resilience of enterprises and overcoming the negative consequences of COVID-19"		x	
3	B. Rivza, T.lejava, M.Kruzmetra Changes in the Economy as a System: entrepreneurship under the influence of COVID-19, 27. starptautiskajā zinātniskajā konferencē "Research for Rural Development 2021". https://www2.llu.lv/research_conf/		x	
4	D.Vasilevska, B.Rivza Factors of the effectiveness of innovative development of Baltic states in the context of digitalization. Proceedings https://www.sgem.org/index.php/dates-deadlines/preliminary-conference-programme , 20 AUG, 2020	x		
5	Kruzmetra Z., Bite D. Review on the consumers` response to the Covid-19 crisis in Latvia. In: 22nd International Scientific Conference ECONOMIC SCIENCE FOR RURAL DEVELOPMENT 2021, 11-14 May 2021, Jelgava, Latvia conference proceedings		x	
6	Blended learning in lifelong adult education in the aspects of Covid-19 epidemical restrictions, Journal " Rural Sustainability Research" 2021". L.Ābele, B.Rivža		x	
7	Brence, I., Beizitere, I., Sloka, B. "Public Financial Support for Micro-enterprises in the COVID-19 Crisis" /XIV International and Near Eastern Congress Series on Economics, Business and Management Plovdiv, Bulgaria / http://www.ibaness.org/ / Open Access	x		
8	V.Hohlova, The Impact of the Covid-19 Pandemic of the Unemployment Rate in Latvia", International Conference "Research for Rural Development"proceedings 2021.		x	
9	D.Stefenberga "Factors of the Regional Competitiveness in Kurzeme" Proceedings of 15. International Conference "Social Sciences for Regional Development 2020", Daugavpils University.	x		
10	Assessment of business environment development perception under the influence of Covid-19: the case of Latvia / Andra Zvirbule, Gunta Grinberga-Zalite, Aina Muska // NORDSCI International conference Law and political science: conference proceedings, Sofia, Bulgaria, 12-14 October, 2020 : Online Exclusive Event / NORDSCI Review Committee Sofia, 2020. Book 2, Vol. 3: Business and management. Law. Political science, 21.-30.lpp. ISBN 9786197495140. ISSN 2603-4107.	x		

	Danovskis, E. "Use of videoconferences in decision making and communication in government institutions" / Latvijas Universitātes 2021. gada starptautiskās konferences tiesību zinātnes sekcijas rakstu krājums, Open Access		x	
11	Danovskis E. Problems of employment regulations in the government in the context of pandemics. Conference proceedings of the legal section of the Annual Internatioinal Scientific Conference of the University of Latvia		x	
Conference materials - summaries (abstract max 1 page)				
1	Labour market challenges caused by global digitalization: lessons from Covid-19 / Andra Zvirbule, Gunta Grinberga-Zalite// GCABSS-2020 : Proceedings of global conference on advances in business and social sciences "New challenges and opportunities of globalization and integration" : online, Tsuruoka, Japan, December 5-6, 2020 Research Center for New Business Strategies - Tsuruoka, 2020 - N 201208, 12.lpp. - ISSN 2436-083X; https://rcnbs.com/publication/proceedings/gcabss/gcabss2020v1.pdf	x		
2	L.Azena "The impact of the Covid-19 pandemic on business in the Latvian economic sector"/abstract of the 15th international science regional development 2020 conference (Daugavpils University). http://humanitiessocial.lv/wp-content/uploads/2021/04/SZF-krajums_III_Ekonomika_2021_tirraksts.pdf	x		
Anonymously reviewed monographs				
1	Edited by I. Pilvere (team of 29 authors) Restructuring local food chains and strengthening resilience during crisis and post-crisis in Latvia, SIA Drukātava, Jelgava, 2021, 464p. (Vietējo pārtikas ķēžu pārstrukturizēšana un noturības stiprināšana krīzes un pēckrīzes laikā Latvijā. (2021). Autoru kolektīvā zinātniskā monogrāfija, galvenā redaktore Irina Pilvere, Latvijas Lauksaimniecības universitāte un Dārzkopības institūts, SIA Drukātava, Jelgava, 464 lpp.)	x		
2	Monograph reviewed by the authors: Ekonomiskais, politiskais un juridiskais ietvars Latvijas tautsaimniecības potenciāla saglabāšanai un konkurētspējas pieauguma veicināšanai pēc pandēmijas izraisītās krīzes.			x
Other scientific outputs not included in previous categories				
1	Web magazine "Professional Gardening", an article about the results of VPP reCOVery-LV on horticulture, Edīte Kaufmane, Līga Lepse.	x		
2	Research presentations at the 79 th International Scientific Conference of the University of Latvia in special conference session devoted to "reCOVery-LV", 04.03.2021, 12 reports were presented by project "reCOVery-LV" researchers: https://www.bvef.lu.lv/petnieciba/konferences/lukonferences/latvijas-tautsaimniecibas-potenciala-saglabasana-un-konkuretspejas-pieauguma-veicinasana-pecc-pandemijas-krizes/	x		
3	Research presentations at the 79 th International Scientific Conference of the University of Latvia in special conference session devoted to "reCOVery-LV", 04.03.2021, 12 reports were presented by project "reCOVery-LV" researchers: https://www.bvef.lu.lv/petnieciba/konferences/lukonferences/latvijas-tautsaimniecibas-potenciala-saglabasana-un-konkuretspejas-pieauguma-veicinasana-pecc-pandemijas-krizes/	x		

	konferences/latvijas-tautsaimniecibas-potenciala-saglabasana-un-konkuretspejas-pieauguma-veicinasana-pec-pandemijas-krizes/			
4	Presentation at the 79 th International Scientific Conference of the University of Latvia in special conference session devoted to VPP Covid-19 research projects "Latvijas pētnieku ieguldījums COVID-19 sekū mazināšanā", I. Šteinbuka "Towards the Post-pandemic Recovery: Opportunities and Risks of Latvian Economic Development"; https://www.youtube.com/watch?v=kUYAoZpPCQY	x		
5	Online conference "Productivity Dialogue": https://www.bgef.lu.lv/petnieciba/petnieciba/zinatniskie-instituti/lu-domnica-lv-peak/ ; https://www.bgef.lu.lv/petnieciba/petnieciba/zinatniskie-instituti/produktivitates-dialogs/	x		
6	A comparative review of socio-economic implications of the coronavirus pandemic (COVID-19) in the Baltic States; https://www.bgef.lu.lv/fileadmin/user_upload/LU.LV/Apaksvietnes/Fakultates/www.bgef.lu.lv/6.ZI_NATNE/Instituti/LV_PEAK/Baltic-Assembly_final_02.11.2020.pdf ;	x		
7	International development scenarios in the context of the COVID-19 pandemic; https://www.bgef.lu.lv/fileadmin/user_upload/LU.LV/Apaksvietnes/Fakultates/www.bgef.lu.lv/6.ZI_NATNE/Instituti/LV_PEAK/reCOVery-LV_Starpt_attist_scenariji.pdf	x		

