

The background features a complex, abstract design with overlapping circular and semi-circular shapes. Some of these shapes contain halftone patterns or images of people, such as a woman's profile in the bottom right. The color palette is primarily light blue and white, with accents of dark blue and red. The overall aesthetic is modern and geometric.

# The Shape of (Central) Europe 2020

ANNUAL  
CONFERENCE  
ASPEN INSTITUTE CE

19 November 2020  
[AspeninstituteCE.org](http://AspeninstituteCE.org)



# The Shape of (Central) Europe 2020

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# Aspen Institute Central Europe

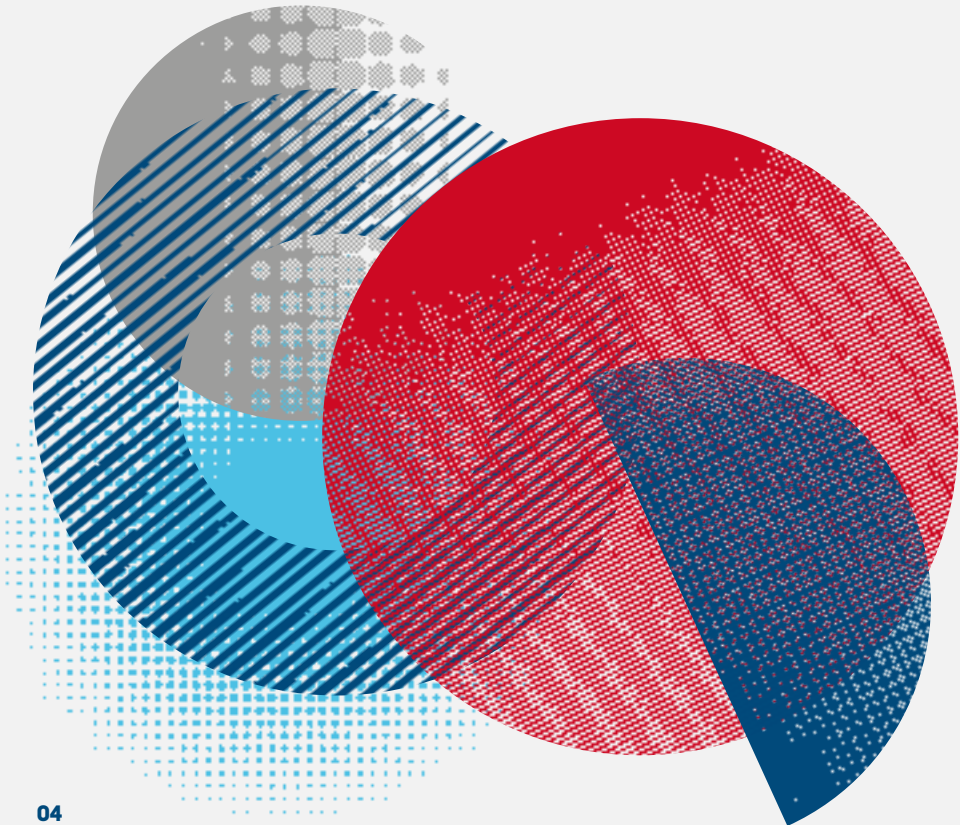
Short Introduction About Aspen Institute CE

## Our mission

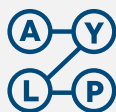
We connect and inspire people who want to improve society.

## Who we are

Aspen Institute CE is an independent platform where representatives from politics, business and public institutions as well as personalities from the arts, sports and science meet. With the participation of figures from various disciplines, we organize public conferences, seminars, workshops and professional discussions.



## Leaders, celebrities, politicians, the public



### Aspen Young Leaders Program

Every year, young people from various disciplines meet in this program to discuss the challenges today's society is facing and the role they play in them. The basic idea of the program is to encourage these promising young people to pause and reflect on the impact of their activities on the world, on society and on the future.

## The Shape of (Central) Europe

### Annual Conference

Aspen Institute CE holds the annual conference entitled *The Shape of (Central) Europe* at which the results of the year-round work of expert groups – a comprehensive and long-term perspective on political, economic and social developments in the Czech Republic and in Central Europe – are presented. Public figures can formulate new ideas that encourage society and its leaders to engage in self-reflection and comparison, and prompt discussion about other political strategies in Central Europe.



### Highlighting topics of public interest

The Aspen Institute CE expert meetings allow for a multifaceted discussion between policymakers and influential business and public figures. They address themes that resonate in politics, but also the impact of innovation and technology on the development of society, democracy, quality of life, change and formation of public opinion and its participation in decision-making. Global issues, transatlantic relations, and the problems of Europe and the Central European region are discussed.

## ASPEN Review

### Aspen Review

The Aspen Review is a quarterly magazine in which the Aspen Institute CE provides space for a wide range of views on topical issues that resonate in society. The magazine offers analyses, interviews and commentaries by world-renowned professionals as well as Central European public figures, journalists, scientists and academics.

# Foreword

| Annual Conference  
Aspen Institute CE



The annual conference *The Shape of (Central) Europe 2020* takes place at a difficult time marked by the Covid-19 pandemic which has impacted all areas of our lives. What better time than today, however, to seriously consider making structural changes in our behavior and the way our entire society works?

Aspen Institute Central Europe has thus connected up with leading experts to prepare studies that will be reviewed and commented on by the specialists most qualified to do so. This year's topics concern Central Europe as a whole as well as the Czech Republic in particular – these can, however, also serve as an inspiration for other countries.

The conclusions and recommendations of the study entitled *Restarting Central Europe*, prepared in cooperation with McKinsey & Company, will be discussed by representatives of the governments of the Czech Republic and Austria, as well as by the mayors of Prague, Warsaw, Bratislava and Budapest together with additional experts. We also plan to deal with the long-term and strategic priorities to be followed by countries and large cities in the future.

Education in all its forms is also experiencing a seismic shift. What will prove to be important in the future and what are the potential pitfalls on the road? These and other things will be discussed in connection with the results of the study *Background to Failures in Education: Social Problems and Funding*.

The example of the Czech space program will demonstrate the ways in which we can utilize innovation. This constitutes a great opportunity for Czech science and industry. Where there are clear priorities and where the roles played by the state, business and research are clearly delineated, this approach can improve competitiveness and demonstrate the way to effectively address similar challenges.

This is not all, however, that the Aspen Institute Central Europe and its expert groups have to offer. We would like to focus on three long-term priorities. The first is *leadership*. In our opinion, we all lack leaders able to listen to others, discuss and make decisions that benefit all society. *Education* is another priority, especially the role of principals, the importance of lifelong learning and cooperation among universities, business and research centers. Last but not least, there is *digitalization* and the ways to plan for and implement it. We believe these topics are key to the prosperity of any contemporary society.

I would like to express my gratitude to all our partners and sponsors for their cooperation and support. I would also like to extend my thanks to all those who have helped prepare the studies and participated in the round-tables, public debates and otherwise contributed to organizing this year's conference.

Finally, I would like to express my sincere hope that all of us who concern ourselves with the well-being of our democratic society will be able to maintain our courage, positive energy and humility.



Milan Vašina,  
Executive Director of Aspen Institute Central Europe

## Program

8.50–9.00

### Opening

**Zuzana Řezníčková**, President, Economia Media House

**Ivan Hodáč**, President, Aspen Institute CE

**Milan Vašina**, Executive Director, Aspen Institute CE

09.00–9.40

### Restarting Central Europe

*The panel will be in English with simultaneous translation in Czech.*

*Introductory  
Presentation:*

**Dan Svoboda**, Managing Partner, McKinsey & Company Czech Republic and Slovakia

*Speakers:*

**Andrej Babiš**, Prime Minister of the Czech Republic

**Sebastian Kurz**, Chancellor of Austria (*Video Message*)

**Karoline Edtstadler**, Federal Minister for the EU and Constitution, Austria

**Karel Havlíček**, Deputy Prime Minister, Czech Republic

9.40–9.50

### Break

9.50–10.50

### City Strategies – Getting Back to the Next Normal

*The panel will be in English with simultaneous translation in Czech.*

*Introductory  
Presentation:*

**Dan Svoboda**, Managing Partner, McKinsey & Company Czech Republic and Slovakia

*Speakers:*

**Zdeněk Hřib**, Lord Mayor of Prague

**Gergely Karácsony**, Lord Mayor of Budapest

**Rafał Trzaskowski**, Lord Mayor of Warsaw

**Matúš Vallo**, Lord Mayor of Bratislava

10.50–11.05

### Break

11.05–11.30

### How Will the Pandemic Change Europe?

*Speaker:*

**Ivan Krastev**, Centre for Liberal Studies, Sofia/Institute for Human Sciences, Vienna (IWM)

*Ivan Krastev's reflection on the world after the Covid-19 pandemic. He is a globally renowned political scientist and author of the bestseller *After Europe* and the essay *Is It Tomorrow Yet? Paradoxes of the Pandemic*. Has the pandemic just accentuated some of the long-standing trends? What challenges will the national states and the EU face?*

11.30–11.45

### Break



- 11.45–12.45 **Security–Innovations**  
**Defense & Space: Opportunities for Science and Industry**  
*The panel will be in Czech with simultaneous translation in English.*  
*Introductory Presentation:* **Tomáš Pojar**, Head of Aspen Institute CE Expert Group/Vice-President, CEVRO Institute  
*Speakers:* **Tomáš Pojar**, Head of Aspen Institute CE Expert Group/Vice-President, CEVRO Institute  
**Ladislav Stahl**, Director of SATCEN, Military Intelligence  
**Petr Bareš**, President, Czech Space Alliance/Managing Director, Iguassu Software Systems  
**Patricie Ondriašová**, OHB System  
**Jan Souček**, Institute of Atmospheric Physics, Czech Academy of Sciences
- 12.45–13.00 **Break**
- 13.00– 13.10 **Digitalization: A New Impulse for the Central European Economy**  
*The panel will be in Czech with simultaneous translation in English.*  
*Speaker:* **Petr Šmíd**, Head of Consumer Marketing CEE, Google
- 13.10– 13.15 **Break**
- 13.15–14.15 **Regional Differences–Education**  
**Background to Failures in Education: Social Problems and Funding**  
*The panel will be in Czech with simultaneous translation in English.*  
*Introductory Presentation:* **Daniel Prokop**, Head of the Aspen Institute CE Expert Group/Founder, PAQ Research  
*Speakers:* **Robert Plaga**, Minister of Education, Youth and Sports  
**Daniel Münich**, Advisor to the Aspen Institute CE Expert Group/ Executive Director of think-tank IDEA, CERGE-EI  
**Zuzana Ramajzlová**, Head of Educational Services, People in Need  
**Jan Straka**, Co-founder, TeachLive  
**Libor Witassek**, Independent Businessman, Representative of the City of Opava
- 14.15–14.20 **Break**
- 14.20–14.30 **Aspen Central Europe Leadership Award 2020 Ceremony**  
**Michaela Bakala**, Philanthropist, Representative of Aspen Institute CE’s General Partner, Fondation Zdenek and Michaela Bakala  
**Ivan Hoďáč**, President, Aspen Institute CE

**Michala Hergetová** will chair the conference, guide the panels and facilitate the talks.

# Speakers





### **Andrej Babiš**

Andrej Babiš is the Prime Minister of the Czech Republic. He graduated from the University of Economics in Bratislava. He founded Agrofert, currently the largest Czech agricultural, food and chemical holding, in 1993. Andrej Babiš entered politics in the fall of 2011 in a stand against systemic corruption which had grown within the public administration. His speech attracted the response of thousands of citizens and led to the establishment of the ANO movement in November 2011. As its leader, he succeeded in the parliamentary elections in 2013 as well as 2017. Andrej Babiš was given the award of Minister of Finance of the Year for the area of developing European economies in 2016.



### **Michaela Bakala**

Michaela Bakala is an entrepreneur, manager, but most of all, a mother and philanthropist. The causes dearest to her are those related to education, the development of democratic society and women's role in society. She is Chair of the Board of Trustees of the Bakala Foundation in the Czech Republic and the Fondation Zdenek et Michaela Bakala in Switzerland. Both of them focus on education and operate scholarship programs for talented students. Together with her husband Zdeněk Bakala, she became involved in establishing a Central European branch of Aspen Institute. She is Vice-chair of the Board of Trustees of the Václav Havel Library, and also a proud patron of the TOP Czech Women Awards project.



### **Petr Bareš**

Petr Bareš is the co-founder and president of the Czech Space Alliance and managing director of Iguassu Software Systems. He emigrated from Czechoslovakia to the UK in 1968 where he graduated from the University of London. He has been working in the space field since 1975 when he became the first Czech born employee of

the European Space Agency. He returned to Prague in 1997 and led a management-buy-out of Science Systems CZ in 1999, now Iguassu Software Systems, a key supplier of GNSS and SSA software to ESA. Petr Bareš has broad international experience covering Europe, Latin America and south-east Asia and was one of only two private members of the Czech ministerial team drafting the National Space Plan. The plan was approved by the government and led to very significant changes in Czech space governance.



### **Karoline Edtstadler**

Karoline Edtstadler is an Austrian former criminal judge and politician who has been serving as minister for the EU and the constitution at the Austrian Chancellery in the government of Chancellor Sebastian Kurz since 2020. Over the course of her career, she was a policy adviser in the cabinet of the Minister of Justice and worked as a State Secretary in the Ministry of the Interior. As a Member of the European Parliament, Karoline Edtstadler served on the Committee on Civil Liberties, Justice and Home Affairs and on the Subcommittee on Human Rights.



### **Karel Havlíček**

Karel Havlíček is the Deputy Prime Minister, Minister of Industry and Trade and Minister of Transport. He graduated from the Faculty of Civil Engineering at the Czech Technical Faculty, studied at PIBS at Manchester Metropolitan University and received his Ph.D. at University of Economics in Prague where he also earned the title “Docent”. He has been a long-term advocate for entrepreneurs, mainly as the Chairman of the Board of Directors of the Association of Small and Medium-Sized Enterprises and Crafts of the Czech Republic. He is the co-owner and CEO of the SINDAT group which has developed over the past twenty years into a respected investor in the area of small and mid-sized industry and new technologies. Karel Havlíček has been a member of numerous advisory bodies in

the government and ministries. Since 2014, he has been a member and since 2018 the Deputy Chairman of the Governmental Research, Development and Innovation Council. Karel Havlíček is the author of the Innovation Strategy of the Czech Republic 2019–2030.



### **Michala Hergetová**

Michala Hergetová is a TV reporter and host of business news and events. She graduated from the University of Economics in Prague in 2005 with a major in International Trade and European Integration. She interrupted her studies for a Joint European Studies Program at Staffordshire University in the UK and University of Antwerp in Belgium. Her professional career began with the TV3 channel where she focused on economics and politics. She also worked as PR Director for the National Trade Promotion Agency – CzechTrade. During the floods in 2002, she led the CzechTrade and Radio Impuls Flood Center. She has worked for Czech TV in different positions since 2005 and hosts various events and debates.



### **Ivan Hodáč**

Ivan Hodáč is the Founder and President of the Aspen Institute Central Europe. He completed his education at the University of Copenhagen and the College of Europe in Bruges. He worked as Secretary-General of the European Automobile Manufacturers' Association (ACEA) from 2001 until 2013. He was among other things a member of a special advisory group of experts, which was advising the European Commission in the negotiation of the Transatlantic Trade and Investment Partnership with the United States (TTIP). Before joining ACEA, he worked as Senior Vice-President and Head of the Time Warner Corporate office for Europe and Secretary-General of the trade organization IFMA/IMACE. Ivan Hodáč currently works as senior adviser at Teneo CabinetDN,

a leading consultancy on the EU. The Financial Times listed him among the most influential personalities in Brussels politics.



### **Zdeněk Hřib**

Zdeněk Hřib is a Czech politician, manager and physician. He has held the post of Mayor of Prague since November 2018. After graduating from the third Faculty of Medicine at Charles University, he worked as project manager in the fields of Medicine and IT. He has been in charge of the Institute for Applied Research, Education and Management on Medicine since 2012. Over the course of his career, he has participated in several work groups focusing on IT and quality of service on governmental, European and global levels. He is also a published author in numerous domestic and foreign media. As the Mayor of Prague, he is responsible for the sectors of IT, security, European funds and foreign relations.



### **Gergely Karácsony**

Gergely Karácsony is a green, left-wing politician, Mayor of Budapest, and co-chair of the Dialogue (Párbeszéd) party. He was elected Mayor in October 2019 as the joint candidate of five Hungarian opposition parties. He previously served as Mayor of Budapest's 14<sup>th</sup> district (2014–2019) and MP of the LMP party (2010–2013). Gergely Karácsony is a sociologist and former university lecturer by profession specializing in electoral behavior, political culture, election campaigns and electoral systems.



### **Ivan Krastev**

Ivan Krastev is the chair of the Centre for Liberal Strategies and permanent fellow at the Institute for Human Sciences, Vienna. He is a founding board member of the European Council on Foreign Relations, a member of the Board of Trustees of the International Crisis Group and

a contributing opinion writer for the New York Times. Ivan Krastev is the winner of the Jean Améry Prize for European Essay Writing 2020. His latest book *Is it Tomorrow, Yet? How the Pandemic Changes Europe* has been published in more than 20 languages.



### **Sebastian Kurz**

Sebastian Kurz started his political career in his home city of Vienna serving as a member of the City Council. He was appointed State Secretary for Integration at the Federal Ministry for the Interior in 2011. He served as Federal Minister for Europe, Integration and Foreign Affairs from 2013 to 2017. Sebastian Kurz held the office of Chancellor first from December 2017 to May 2019 (after the resignation of Vice Chancellor Reinhold Mitterlehner) and was sworn in as Federal Chancellor of the Republic of Austria for the second time on 7 January 2020. He has been chair of the Austrian People's Party (OeVP) from 2017.



### **Daniel Münich**

Daniel Münich received his Ph.D. in economics from CERGE at Charles University. He has served as the Executive Director of the academic think-tank IDEA at CERGE-EI since 2012. He focuses on research in the fields of labor economics, economics of education and schooling and bibliometric analysis. He was a member of the National Economic Council of the Czech Government NERV II where he coordinated preparations for the chapter on education. He has served for many years as a senior adviser to the European Network of Economists of Education, and is a leader of the national team in the European project Euromod. Daniel Münich is also a member of the advisory board for policy impact evaluation to the legislative council of the Czech Government, and he has been a member of the National Council for Budgetary Forecasts since 2018.



### **Patricie Ondriašová**

Patricie Ondriašová graduated from the Faculty of Mechanical Engineering in Brno. During her studies, she became involved in projects for the European Space Agency run by SAB, a Czech start-up company. One of the most important projects was participation in the development of the Vega PoC SSMS dispenser for small satellites for the Vega European launcher which is able to send several small satellites simultaneously into orbit. Patricie Ondriašová currently works as Supply Quality Manager/Product Assurance in the OHB System, one of the leading European companies in the sector of space technologies.



### **Robert Plaga**

Robert Plaga is the Minister of Education, Youth and Sports of the Czech Republic. He graduated from the Faculty of Business and Economics of Mendel University in Brno, where he also taught between 2002 and 2013. He held the position of Director of the Technology Transfer Center from 2013 to 2015 and was appointed the Deputy Minister of Education for Higher Education, Science and Research in 2015. Before assuming the Minister's office, he was a city councilor in Brno.



### **Tomáš Pojar**

Tomáš Pojar is the Vice-President of the CEVRO Institute, Vice-President of the Czech-Israeli Chamber of Commerce and a security and defense consultant. He studied political science at the Faculty of Social Studies of Charles University and Counter-terrorism Studies and Homeland Security at the Interdisciplinary Center in Israel. In 1995, he began to work for the NGO People in Need, which he led from 1997 to 2005. He joined the Ministry of Foreign Affairs in 2005, where he served as Deputy Minister for Bilateral Relations and First Deputy Minister for Security and EU Affairs as well as bilateral



relations with European states. He was Ambassador of the Czech Republic to Israel from 2010 to 2014.



### **Daniel Prokop**

Daniel Prokop is a sociologist focused on political, social and educational research. He implemented numerous innovations to Czech election surveys and has been recently focusing on research of social problems and educational inequalities. With this intent, he founded the PAQ research agency. He was also a member of the expert group preparing the educational strategy 2030+. He published a successful book on social and educational problems, *Blind Spots (Slepé skvrny)* in 2020. In the past, he worked for the MEDIAN agency for almost 10 years.



### **Zuzana Ramajzlová**

Zuzana Ramajzlová studied sociology and social politics at the Faculty of Social Sciences of Charles University, Prague. She currently manages the educational services of the Programs of Social Integration at People in Need. In the past, she was in charge of the Varianty program, supporting the educational courses for teachers and managing a project focused on aid to Roma survivors of WW2. Zuzana currently manages trans-regional projects focused on education of children with a socially disadvantaged background. She also gained professional experience as the director of the Center for Integration of Foreigners. Zuzana Ramajzlová is a member of the APIV B professional platform and has been a long-term collaborator with other NGOs. She has been involved with the topic of inequalities, mainly in education, since 2001.



### **Zuzana Řezníčková**

Zuzana Řezníčková is the Chief Executive Officer of BM Management, which manages the assets of the investor Zdeněk Bakala. She is also the CEO of Luxury Brand Management and the Chair of the Board of Directors of the Economia media house, whose portfolio includes, for example, Hospodářské noviny, Respekt weekly and the news websites iHNed.cz and Aktualne.cz. She chairs the Supervisory Board of the Bakala Foundation. Zuzana Řezníčková previously held management positions in ČEZ, MEDIATEL and O2. She also held the position of Vice President for Marketing and Sales at Czech Airlines.



### **Ladislav Stahl**

Ladislav Stahl is a graduate of the Military Academy in Brno, Charles University in Prague and CEVRO Institute. He has acted as the director of Satellite Center Czech Republic (SATCEN CR) since 2018. He previously held leading and analytical positions related to imaging and remote Earth observation in the field of defense. He took part in several military operations abroad. He worked for the EU, namely in the Operations Division of the European Union Satellite Centre for three years. Ladislav Stahl currently serves as the director of the Space Technologies expert section on the Board for Research, Development and Innovations at the Ministry of Defense of the Czech Republic.



### **Jan Souček**

Jan Souček works as a researcher at the Institute of Atmospheric Physics of the Czech Academy of Sciences where he focuses on experimental physics of cosmic plasma, analysis of satellite measurements and mainly on development of devices for future space projects. He is responsible for one of the Czech devices on the European probe Orbiter that has been recently launched to the Sun. He is

also a technical director for development of devices for the JUICE probe heading to the moons of Jupiter, the cometary probe Comet Interceptor and the space x-ray telescope Athena.



### **Jan Straka**

Jan Straka studied political and social science at Harvard University. He is the co-founder and co-director of the Teach Live NGO. For several years now, this organization has strived to transform the Czech educational system through its flagship projects Teach Live and Lead Live. Jan Straka previously worked for the Depositum Bonum foundation where he assisted in starting and later managing several education-focused projects. Before his work for the foundation, he worked for the IDEA think tank where he participated in strategic analyses of the Czech education system. He was included in the list 30under30 by Forbes Czech Republic.



### **Dan Svoboda**

Dan Svoboda works as Managing Partner at McKinsey & Company Czech Republic and Slovakia. He graduated from Cornell University and received his MBA from Harvard Business School. He has more than fifteen years of experience with strategic consulting, mainly in the area of large companies transformations and operational efficiency improvement. Key managers from the sectors of financial services, telecommunications, energy and heavy industry are among his clients. He is one of the leaders of McKinsey Service Operations for Europe, the Middle East and Africa which focuses on company performance improvement through digital transformations programs.



### **Petr Šmíd**

Petr Šmíd manages the B2C marketing for Google Central and Eastern Europe so as to bring the best of Google consumer technologies to its users. He began his career in McKinsey & Company where he spent 7 years analyzing the banking and health sectors, with marketing being at the core of every project. Apart from his studies at CEMS and INSEAD MBA, Petr Šmíd is enthusiastic about education, often facilitating workshops for students, professionals, startups, etc. Life-long education is also an important part of the Grow with Google program which helps people grow in their careers or business.



### **Rafał Trzaskowski**

Rafał Trzaskowski is a Polish politician, political scientist and current Mayor of Warsaw. He studied international relations and English at the University of Warsaw where he also obtained a Ph.D. in 2004. Before entering politics, Rafał Trzaskowski worked as a translator and interpreter. He served as a Member of European Parliament (2009–2013) and acted as Minister of Administration and Digitization in PM Tusk's government (2013–2014). He was elected a Member of the Polish Parliament for the Civic Platform in 2015 and became Mayor of Warsaw in October 2018. Two years later, he was the Civic Platform candidate in the presidential elections where he lost to Andrzej Duda with 48.97% votes.



### **Matúš Vallo**

Matúš Vallo is an architect, urban activist, musician and current Mayor of Bratislava. He was the person behind the Mestske zasahy (Urban Interventions) initiative which has prepared over 900 projects for public space improvement in twenty Slovak and Czech cities since 2008. He founded My sme mesto (We Are the City) and Aliancia Stará Tržnica civil associations in Bratislava. He has

led the preparations of the Plán Bratislava: Návod na lepšie mesto (Bratislava Project: Instructions for a Better City) document from 2016 which he applied with as an independent candidate for the post of Mayor of Bratislava. He won the elections in November 2018 with 36% votes.



### **Milan Vašina**

Milan Vašina is a graduate of the Faculty of Business and Economics of Mendel University in Brno. He spent most of his professional career in telecommunications. He began as head of marketing communication at Radiomobil, the company that brought the mobile operator Paegas to the Czech market, and remained loyal to his employer for more than two decades. He was the CEO of T-Mobile Slovakia from 2007. Milan Vašina served as CEO of T-Mobile Czech Republic from 2011 and CEO of T-Mobile Czech Republic and Slovak Telekom from 2016. Since leaving top management in 2018, he has worked as a consultant and coach. He took up the position of Executive Director of Aspen Institute Central Europe in July 2020.



### **Libor Witassek**

Libor Witassek is a Czech cybernetic scientist, entrepreneur and transformations manager. He held a post in the top management of the Swedish GCE Group from 2015–2016 and acted as the CEO and chairman of the board of the Vítkovice engineering concern from 2016–2017. Libor Witassek currently works as a consultant in his own company DC VISION focused on transformations. He is the owner of STROJCAR – a company manufacturing parts for the air and space industry and co-owner of Opava Re-skilling Center which provides dual education in engineering. Apart from numerous publications, Libor Witassek is the author of the Lean Leadership® methodology and a donor to the Anticorruption Endowment.

# What We Have Done Since Last Year's Conference

Throughout the year, the Aspen Institute Central Europe traditionally organized public discussions and round tables for topics following the annual conference *The Shape of (Central) Europe*. This year, despite the Covid-19 outbreak and the consequent restrictions, we continued with our projects. In cooperation with the media house *Economia*, we created an online platform for debates, which were streamed live to *ihned.cz*, Facebook and the LinkedIn pages of the Aspen Institute Central Europe. The audience was also able to submit its questions via an online platform. In the fall, we managed to return to the traditional form and organized a panel discussion.

## Will Coronavirus Increase the Resilience of the Czech Economy?

At the end of April, we organized the first of a series of virtual discussions entitled *Will Coronavirus Increase the Resilience of the Czech Economy?* The debate was hosted by **Martin Ehl**, Chief Foreign Policy Analyst in *Hospodářské noviny*. The participants were **Tomáš Kopečný**, Deputy Minister of Defence, **Lubomír Kovařík**, Manager at *Česká zbrojovka*, **Petr Očko**, Deputy Minister for New Technologies at the Ministry of Industry and Trade, and **Tomáš Pojar**, Vice-President of CEVRO Institute. They discussed the security and resilience of the Czech Republic and its economy in times of crisis. In addition, the possibilities of the pandemic's positive impact and the newly emerged opportunities for the domestic economy were acknowledged. It included a demand for improvement of cooperation between the private sector and the state. Furthermore, the Czech Republic should bolster economic independence. The speakers also discussed whether it would be possible to use investments to increase the competitiveness of the Czech economy in the strategic fields. Finally, they considered the amendment of the Law on Public Procurement.

## **The Czech Republic Is Suddenly Digital. How to Ensure Its Cybersecurity?**

The second virtual discussion reflected on the transfer to digital space during the Coronavirus crisis. Leading Czech experts debated the topics of digitization and cybersecurity. It was attended by **Tomáš Pojar**, Vice-President of CEVRO Institute, **Lukáš Kíntr**, Acting Deputy Director National Cyber and Information Security Agency, **Karel Medek**, Regional Manager of Security Shared Service Center – Consulting, **Michal Salát**, Threat Intelligence Director Avast, **Aleš Špidla**, President of the Czech Institute of Information Security Managers. **Martin Ehl**, Chief Foreign Policy Analyst in Hospodářské noviny hosted the discussion, which focused on the ongoing process of digitization and associated cybersecurity. The debaters agreed that cybersecurity is underestimated, although the consequences could be severe. Furthermore, they pointed out that computer literacy is still insufficient in the Czech Republic. Schools and other educational institutions should provide lectures on essential elements of cybersecurity.

## **The Digital (Non)Literacy of the Czech Educational System**

The last virtual discussion focused on the quality of distance learning and the use of digital technologies during the pandemic in Czech schools. The participants were **Robert Plaga**, Minister for Education, Youth and Sports, **Daniel Prokop**, the Founder of PAQ Research, **Daniel Münich**, Executive Director of the academic think-tank IDEA at CERGE-EI, **Marie Čápková**, Principal of the Elementary School Neštěmická and **Ondřej Zapletal**, Director of the Česká spořitelna Foundation. The discussion was hosted by **Petr Honzejek**, Head of the comment section of Hospodářské noviny. The starting point for the debate was a presentation of the results of PAQ and IDEA research on schools' digital readiness. The crisis confirmed the Czech education system's problems, in particular unequal access to education, structural issues of school management, underfunding and others. The associated distance learning has demonstrated that unequal access to digital technologies increases the educational disadvantage of children from underprivileged families.

## **Strategy for Education at the Regional Level**

The panel discussion was held at the Zlín Film Festival as part of the supporting program. Experts, namely, **Jarmila Minaříková**, Lecturer, Mentor, Emeritus Director of a secondary vocational school, **Hana Navrátilová**, Assistant Professor at the Department of School Education TBU, **Lukáš Rejchrt**, Co-Founder and Creative Director of Edhance, **Zdeněk Slejška**, Director of the Eduzměna Foundation, and **Lukáš Trčka**, Executive Director of Technological Innovation Center Zlín, discussed support for education at the regional level with a focus on the Zlín Region. **Michala Hergetová** moderated the debate on education

as an indicator of the region's quality of life and the importance of spreading awareness of its value throughout the Czech Republic. Furthermore, the interconnection of companies, schools, and modern technologies should improve the system's current situation. Towards the end, the discussion moved to the problem of the role of school principals. Instead of managerial and pedagogical activities, they often act as technical building managers. Therefore, it is important to provide school principals with adequate systematic training and education for managerial positions.





# Restarting Central Europe

Dan Svoboda, Tomáš Karakolev, Marek Šandrik, McKinsey & Company  
Prepared for the annual conference of the Aspen Institute CE.

The Covid-19 pandemic is a humanitarian crisis that requires saving lives while safeguarding livelihoods. The virus has spread worldwide despite containment efforts. Never before has the global economy shut down, much less reopened, in the setting of an ongoing pandemic. All major economies have been hit hard: as an example, the impact of Covid-19 in the USA exceeds anything since the end of WWII. In a global survey among ~2,000 executives, the largest group of respondents said they expected a muted economic recovery with possible return only in 2023.<sup>1</sup>

As many countries grapple with a resurgence of infections, the immediate task ahead of us is to mitigate the pandemic and prevent health-care systems from being overwhelmed. In this article, we focus on the next economic normal, which is characterized by a rapid pace of digitization and the imperative to increase productivity. We present six topics in which Central European countries<sup>2</sup> need to progress in order to succeed and selected practical examples to initiate discussion about these topics.

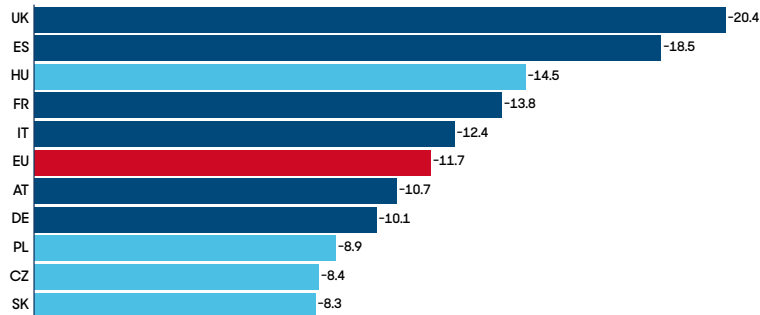
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- 1) SMIT, Sven, Martin HIRT, Kevin BUEHLER, Susan LUND, Ezra GREENBERG and Arvind GOVINDARAJAN. In the tunnel: Executive expectations about the shape of the coronavirus crisis. *McKinsey* [online]. 14. 4. 2020 [retrieved on: 2020-09-28]. Available at: <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/in-the-tunnel-executive-expectations-about-the-shape-of-the-coronavirus-crisis>.
  - 2) This article focuses on the Czech Republic, Hungary, Poland, Slovakia, and Austria calling these countries together "Central Europe" or "CE".

## Covid-19 Effects on the Economy of Central Europe

Covid-19 created an economic crisis with a sharp drop of Q2 GDP driven by reduced consumption and delayed investments. CE countries seem to have fared comparatively well with Q2 GDP decreasing in Austria by 10.7% and in Czech Republic by 8.4%, vs. 11.7% in the EU.<sup>3</sup>

Chart 1: Real GDP growth in 2020 Q2 vs. Q1

Source: Eurostat



Most of the CE countries were impacted less than the EU average, with Hungary being an exception.

To help restart their economies, governments have approved unprecedented support measures. In addition, the EU has dedicated EUR 750 billion to support the recovery through *Next Generation EU*;<sup>4</sup> the budget and funds are already in place. Despite the size of the support, the drawdown mechanism needs to be managed to enable effective access and allocation of capital. Plan development is already in progress at the national level and addresses the topics discussed in this article.

How deep the crisis will be and how fast the economies will recover is still being debated. Research shows that ending lockdowns alone does not fully restore confidence or economic growth. That will happen only when the virus is under control. In countries with “near zero” cases, economic activity has returned to normal; in the others, it is still lower than before the pandemic.<sup>5</sup> In recent consumer research conducted in the summer, only around 30% of those surveyed said they felt safer when government restrictions were lifted. Three other indicators would help people feel safer: seeing people wearing masks, the number of new cases decreasing in their area, and national public-health leaders saying it is safe

3) GDP and employment flash estimates for the second quarter of 2020. Eurostat [online]. 14. 8. 2020 [retrieved on: 2020-09-28]. Available at: <https://ec.europa.eu/eurostat/documents/2995521/10545332/2-14082020-AP-EN.pdf/7f30c3cf-b2c9-98ad-3451-17fed0230b57>.

4) *Europe's moment: Repair and prepare for the next generation* [online]. 27. 5. 2020 [retrieved on: 2020-09-28]. Available at: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_940](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_940).

5) STAPLES, Mark, ed. COVID-19: Implications for business. McKinsey [online]. 23. 9. 2020 [retrieved on: 2020-09-28]. Available at: <https://www.mckinsey.com/business-functions/risk/our-insights/covid-19-implications-for-business>.

to reengage.<sup>6</sup> Until a safe and effective vaccine is available, a “near zero” outcome requires a highly effective program of testing, tracing, isolation of cases, and quarantining contacts.

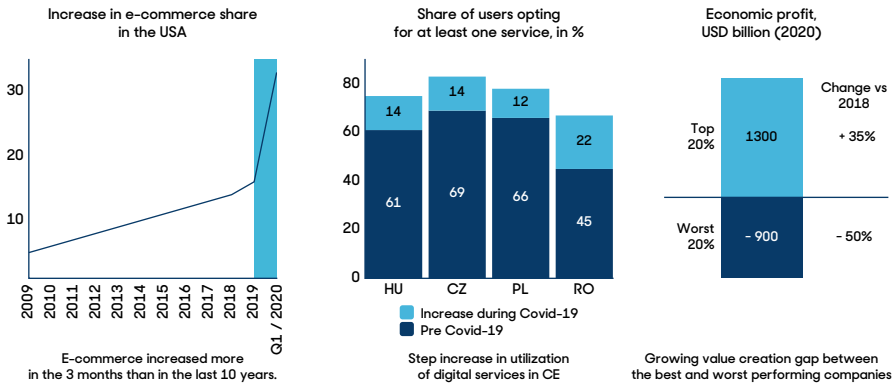
### The Next Digital Normal Is Emerging

In the months of the Covid-19 pandemic, digitization has leaped forward. In the US, e-commerce grew more in three months than over the last ten years. Personal meetings have moved to the virtual space, remote work, and to some distance learning, has become a reality for a large share of the population. Consumer behavior has also changed significantly due to the fast adoption of digital channels.

In Central Europe, the number of digital service users has exploded: for example, in the Czech Republic, it increased by 14 percentage points to 83%. In the first five months of 2020, the digital economy in Central Europe grew by 14.3%, compared to an annual growth of 7.8% in 2017–2019.<sup>7</sup>

#### Chart 2: Digitalization

Source: McKinsey



The next digital normal raises the stakes for both companies and governments. In the corporate world, the gap between the most and the least performing companies has widened. While the top 20% improved value creation by 35%, the bottom 20% increased

6) CHARUMILIND, Sarun, Ezra GREENBERG, Jessica LAMB and Shubham SINGHAL. Covid-19: Saving thousands of lives and trillions in livelihoods. *McKinsey* [online]. 17. 8. 2020 [retrieved on: 2020-09-28]. Available at: <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/covid-19-saving-thousands-of-lives-and-trillions-in-livelihoods>.

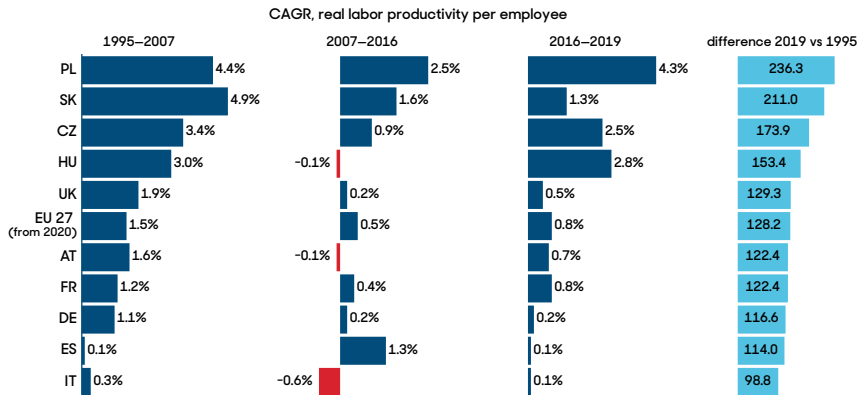
7) *Digital Challengers in the Next Normal*, report by McKinsey (published on 15 October 2020).

value destruction by half compared to 2018.<sup>8</sup> Governments are faced with the imperative to quickly transform and digitize their countries or be left behind in a “winner-takes-all” digital world. Compulsory school education online and remote patient-doctor interactions, which only a year ago seemed futuristic prospects, are now a reality. Future well-being will be determined by how quickly countries can adapt and raise productivity by a mix of capital, education/knowledge, and institutions.

Despite convergence, CE countries except Austria still face a large productivity gap in comparison to EU 15<sup>9</sup> countries or even to EU average. Moreover, their productivity growth has somewhat slowed after the financial crisis.<sup>10</sup>

**Chart 3: Labor productivity comparison (growth over periods)**

Source: Eurostat



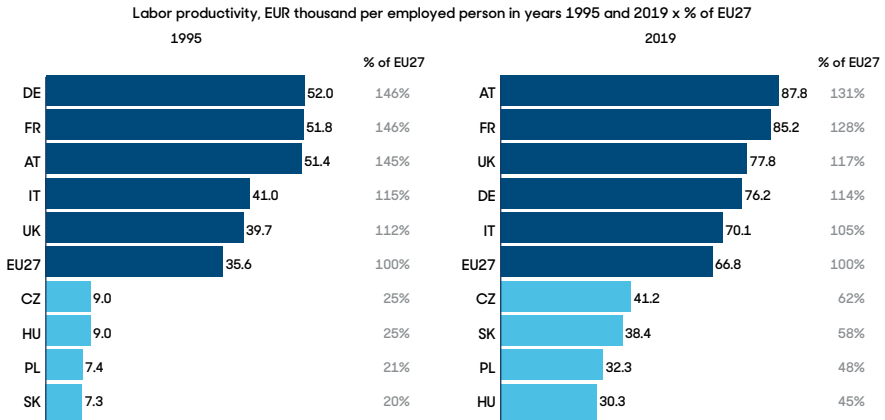
8) BRADLEY, Chris, Martin HIRT, Sara HUDSON, Nicholas NORTHCOTE and Sven SMIT. The great acceleration. *McKinsey* [online]. 14. 7. 2020 [retrieved on: 2020-10-03]. Available at: <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-great-acceleration>.

9) Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Spain, Sweden, United Kingdom.

10) Labor productivity and unit labor costs. *Eurostat* [online]. [retrieved on 2020-10-06]. Available at: [https://ec.europa.eu/eurostat/web/products-datasets/product?code=nama\\_10\\_lp\\_ulc](https://ec.europa.eu/eurostat/web/products-datasets/product?code=nama_10_lp_ulc).

### Chart 4: Labor productivity country comparison in absolute terms

Source: Eurostat



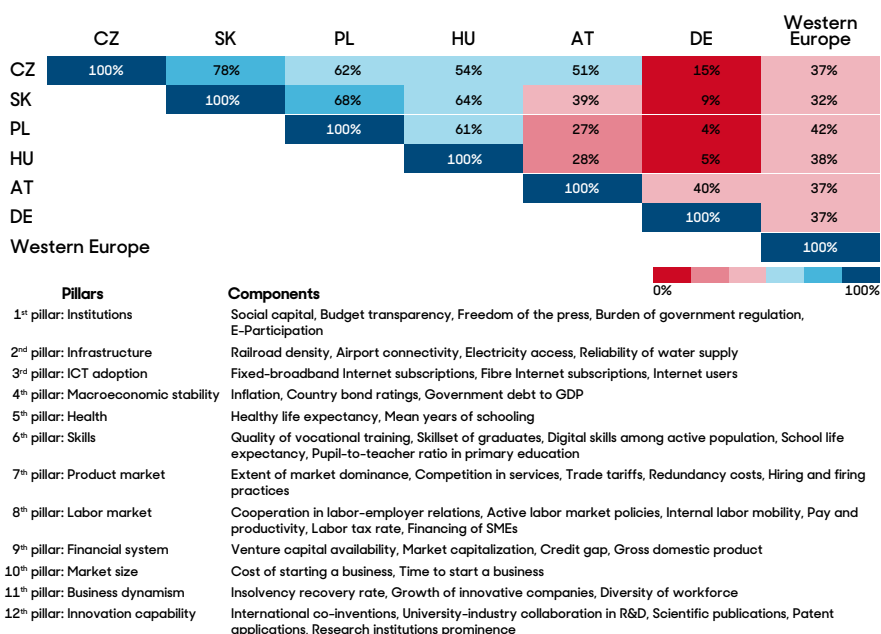
There is still a wide gap, however, between V4 and EU27 average in absolute terms.

Looking at what holds individual countries back, we found that CE countries are relatively similar in their strengths and weaknesses on the individual factors of the *Global Competitiveness Index*.<sup>11</sup> CE countries have much higher correlations of scores among one another than with 15 Western European countries.

11) SCHWAB, Klaus. The Global Competitiveness Report 2019. *World Economic Forum* [online]. 2019 [retrieved on: 2020-10-06]. Available at: [http://www3.weforum.org/docs/WEF\\_TheGlobalCompetitivenessReport2019.pdf](http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf).

## Chart 5: Correlation between countries on the pillars of the Global Competitiveness Report

Source: The Global competitiveness index; World bank



For example, the Czech Republic and Austria both score high in ICT adoption, financial systems, and innovation ability. Despite a similar railroad density, there are differences in the quality of transport infrastructure. The biggest differences are visible in institutions and education.

CE countries can benefit from sharing approaches to improve common weak areas. They are all grappling with public sector digitization. Individual countries can be a source of inspiration for each other whenever there is a clear “local champion”. For example, Austria leads in infrastructure and environment protection, and Poland has experience with educational reform that has delivered significant improvement in outcomes.<sup>12</sup>

In light of the Covid-19 pandemic, CE countries need to revisit their priorities. This can be seen, for example, with *The Country for the Future* strategy of the Czech Republic, which sets a goal to be within the top 20 most developed countries in the world, with a focus on “added value”. While the goal and many topics such as education, physical infrastructure,

12) JAKUBOWSKI, Maciej. *Opening Up Opportunities: Education Reforms in Poland* [online]. Instytut badań strukturalnych, 2015 [retrieved on: 2020-10-06]. Available at: [https://ibs.org.pl/app/uploads/2015/02/IBS\\_Policy\\_Paper\\_01\\_2015.pdf](https://ibs.org.pl/app/uploads/2015/02/IBS_Policy_Paper_01_2015.pdf).

environment protection, and labor market re-skilling remain relevant, Covid-19 has raised the importance of digitization and healthcare reform.

## **CE Digital Normal: A Unifying Set of Topics with Country-Specific Answers**

A common set of topics is emerging for CE countries from the analysis of their competitiveness. Some of these topics are old (e.g., education, transport infrastructure), others have been emerging (e.g., decarbonization, government digitization, re-skilling/upskilling), and some came into focus because of Covid-19 (e.g., healthcare). While the topics are common among CE countries, the starting positions are different and the answers are unique. The next normal is the time for international cooperation, and countries should take time to reflect on their direction and try to learn from each other.

The topics to act on are:

- Quickly digitize all government services, creating an open ecosystem
- Switch from knowledge-based to outcome-based education
- Achieve labor market re-skilling/upskilling
- Set an ambitious decarbonization goal
- Improve health by prevention through primary care and telemedicine
- Strengthen key transport infrastructure by accelerating projects.

In the rest of this article, we elaborate on each of these topics in greater detail.

### **Quickly digitize all government services, creating an open ecosystem**

The Covid-19 pandemic strongly accentuated the need to digitize in both the public and private sectors. There was a strong case for digitization even before Covid-19. The potential economic benefit of digitization is up to EUR 200 billion in additional GDP by 2025 in Central and Eastern Europe.<sup>13</sup> This economic boost would lead to greater global competitiveness and prosperity for the region's 100 million people.

While some private sectors lead the digitization wave (e.g., IT and banking), digitization of government services has been progressing at a slower pace. Some of the key fundamentals for digital growth, such as education, tech ecosystem, and digital infrastructure are on a negative trajectory across CE countries.<sup>14</sup> Most governments are far from capturing

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13) NOVAK, Jurica, Marcin PURTA, Tomasz MARCINIAK, Karol IGNATOWICZ, Kacper ROZENBAUM and Kasper YEARWOOD. *The Rise of the Digital Challengers* [online]. 2018 [retrieved on: 2020-09-28]. Available at: [https://digitalchallengers.mckinsey.com/files/McKinsey%20CEE%20report\\_The%20Rise%20of%20Digital%20Challengers.pdf](https://digitalchallengers.mckinsey.com/files/McKinsey%20CEE%20report_The%20Rise%20of%20Digital%20Challengers.pdf).

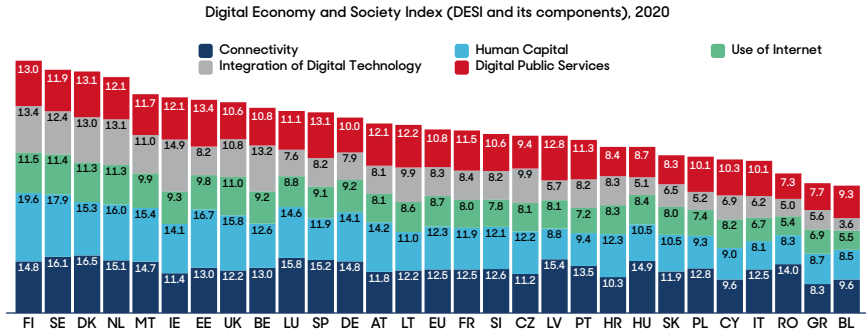
14) *Digital Challengers in the Next Normal*, report by McKinsey (published on 15 October 2020).



the benefits of digitization. As an example, Austria and the Czech Republic rank 13<sup>th</sup> and 17<sup>th</sup> in the Digital Economy and Society Index (2020).<sup>15</sup>

**Chart 6: Comparison using the Digital Economy and Society Index (DESI)**

Source: DESI Index, Eurostat



To move e-government to the next level and achieve excellence, effective governance needs to be established, next-generation technologies deployed, and customer journeys for digital services transformed. In doing so, governments should aim to develop an open ecosystem of private providers that could enhance the user experience by extra services at various steps of the customer journey.

These steps may support the establishment of private providers:

- **Set up a body to oversee the design and implementation** of the entire ecosystem of the ICT portfolio. Such an entity would be responsible for engaging and activating key ICT leaders, for developing a vendor marketplace, and for overseeing delivery.
- **Set up a “CEE Digital Agency”**, which would support national bodies with country ecosystem development with the ultimate goal of creating a single digital market in Central and Eastern Europe.
- **Establish an agile Development Operations (DevOps)** and adopt new infrastructure and technology to ensure the security and efficiency of processes.
- **Focus on customer journeys and customer experience** to build the service in cooperation with users and enable high adoption rates and usability.

15) The Digital Economy and Society Index (DESI). *European Commission* [online]. 19. 6. 2020 [retrieved on: 2020-10-06]. Available at: <https://ec.europa.eu/digital-single-market/en/desi>.

*DubaiNow* is a practical example of an e-government service application. It provides a one-stop portal based on a digital services ecosystem that provides digital access to more than 120 services across ten key areas. The ecosystem also includes easy access to services from a number of private companies – utilities, telecommunications, and even real estate agents. Using the application, people can pay their local bills, settle traffic fines, renew car registrations, or apply for residency. While the Dubai situation is specific, CE countries and cities can learn from some features and approaches. For example, *DubaiNow* is built with Mobile First philosophy, and citizens were invited to participate in the design creation.<sup>16</sup> The *DubaiNow* app is discussed in more detail in the article *City Strategies – Getting Back to the Next Normal*.

### **Switch from knowledge-based to outcome-based education**

Already before the start of the crisis, there was significant room for the improvement of education in the Czech Republic and Austria. Both countries experienced a decline in mathematics and science scores. In contrast, Poland was able to increase its scores across PISA categories: science by 13 points and mathematics by 20 points.<sup>17</sup> This may be attributed to comprehensive educational reform in Poland that included, among other things, a teacher salary increase of 50% from 2006–2012, core curriculum reform in 2008, and a new evaluation system introduced in 2009.<sup>18</sup>

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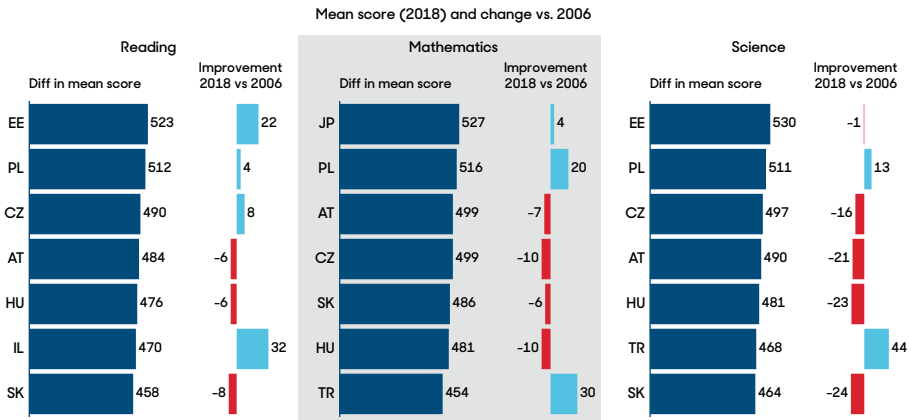
16) *Smart Dubai* [online]. [retrieved on: 2020-09-28]. Available at: <https://www.smartdubai.ae/apps-services/details/dubai-now>.

17) McKinsey analysis based on data provided by PISA (OECD – Programme for International Student Assessment).

18) JAKUBOWSKI, Maciej. *Opening Up Opportunities: Education Reforms in Poland* [online]. Instytut badań strukturalnych, 2015 [retrieved on: 2020-10-06]. Available at: [https://ibs.org.pl/app/uploads/2015/02/IBS\\_Policy\\_Paper\\_01\\_2015.pdf](https://ibs.org.pl/app/uploads/2015/02/IBS_Policy_Paper_01_2015.pdf).

## Chart 7: Comparison of educational results

Source: OECD



Between 2008–2018, Poland demonstrated substantial improvement across all three PISA dimensions.

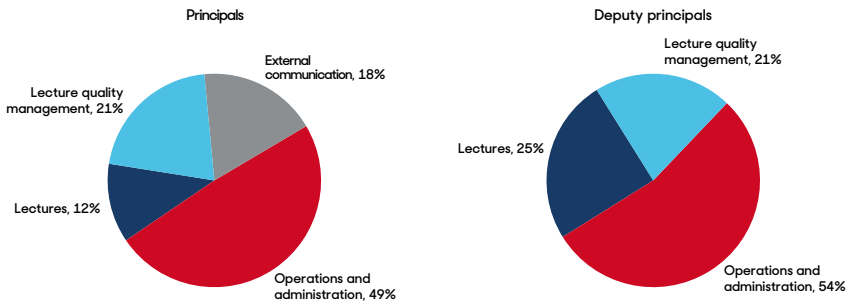
In our 2010 study of the Czech educational system,<sup>19</sup> we indicated three main areas to focus on: quality and development of teachers, quality and development of school principals, and high standards and accountability for results. Unfortunately, in the ten years since publishing that report, there was no systemic change, and the identified problems still persist.

The pandemic showed that schools were generally unprepared for a crisis. Moving to digital delivery was a challenge with great variability across schools. School management played a key role, confirming the conclusion of our 2010 study that the quality of the principal is a key determinant of the quality of the school. Hence, in the next normal, we find it paramount to focus on the development of school principals. Our research has shown that school principals in the Czech Republic spend around half of their time on administrative tasks and operations and only 21% on managing the quality of education. In the best educational systems in the world, school principals spend more than 50% of their time managing the quality of education through coaching teachers on the quality of their delivery.

19) Decreasing results of Czech elementary and secondary education, facts and solutions. *McKinsey* [online]. 2010 [retrieved on: 2020-09-28]. Available at: [https://www.mckinsey.com/cz/-/media/McKinsey/Locations/Europe%20and%20Middle%20East/Czech%20Republic/Our%20work/McKinsey\\_pro\\_bono\\_skolstvi.pdf](https://www.mckinsey.com/cz/-/media/McKinsey/Locations/Europe%20and%20Middle%20East/Czech%20Republic/Our%20work/McKinsey_pro_bono_skolstvi.pdf).

## Chart 8: Work time activities – principals and deputy principals, 2009

Source: McKinsey



Immediate improvements in principal effectiveness could come from:

- **Professional standards.** In Ontario, Canada, for example, school principals have clearly defined required skills, processes, and procedures for each of the areas on which they need to focus.
- **Selection and preparation.** The Singaporean system includes careful selection of school principal candidates (identifying suitable school leadership candidates in the first three years of a teacher’s career), followed by a six-month course and a four- to six-year-long on-the-job educational program similar to an MBA. As one of the Singaporean leaders in the educational sphere said, “We teach teachers how to apply best practice. We teach school principals how to define it.”<sup>20</sup>
- **Lower administrative burden.** Eliminate, standardize, or centralize certain areas (such as procurement); automate or delegate (reporting handed over to an assistant). Examples from companies indicate that the administrative burden can be lowered by 20–40%.<sup>21</sup>
- **Performance management.** School principals should be subject to proactive performance and consequence management (based on the quality of education and not only administrative matters), in which those who do not perform may be replaced.

Some of this would require systemic changes in the decentralized school governance (e.g., centralizing administrative activities on a district or regional level), whilst, for others, setting clear expectations and coaching school principals on priorities would suffice. The

20) Decreasing results of Czech elementary and secondary education, facts and solutions. *McKinsey* [online]. 2010 [retrieved on: 2020-09-28]. Available at: [https://www.mckinsey.com/cz/-/media/McKinsey/Locations/Europe%20and%20Middle%20East/Czech%20Republic/Our%20work/McKinsey\\_pro\\_bono\\_skolstvi.pdf](https://www.mckinsey.com/cz/-/media/McKinsey/Locations/Europe%20and%20Middle%20East/Czech%20Republic/Our%20work/McKinsey_pro_bono_skolstvi.pdf).

21) HEYWOOD, Suzanne, Dennis LAYTON and Risto PENTTINEN. A better way to cut costs. *McKinsey Quarterly* [online]. 1. 10. 2009 [retrieved on: 2020-10-06]. Available at: <https://www.mckinsey.com/business-functions/organization/our-insights/a-better-way-to-cut-costs>.

existing Czech regulation that offers school principals training is heavily focused on the operational and legal aspects of their function, such as relevant regulations or health and safety rules. In order to change the way school principals interact with students, teachers, government, parents, and other stakeholders, we need to start by formally redefining the expectations of their role and creating relevant upskilling programs.

### Achieve labor market re-skilling/upskilling

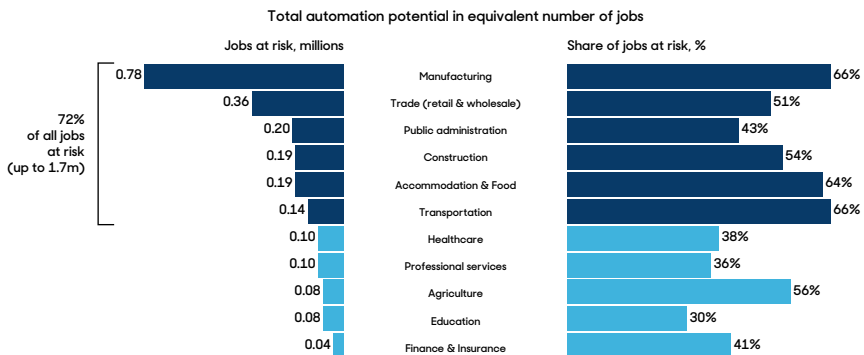
Most of the public debate on digital skills and learning focuses on education; there is little focus on re-skilling or lifelong learning, despite the fact that most of the labor force is no longer at school.

The economy’s evolution and growth and the increasing speed of change create new requirements for the job market. Economies will need to enable the labor to adjust. Our global work task automation models predict that some 51% of workplace activities could be automated by already proven technologies. This number is as much as 66% in the manufacturing sector that provides most employment in the Czech Republic.<sup>22</sup>

**51% of workplace activities could be automated by already proven technologies.**

**Chart 9: Overall potential for automation in the Czech economy**

Source: McKinsey Global Institute



22) MANYIKA, James, Susan LUND, Michael CHUI, Jacques BUGHIN, Jonathan WOETZEL, Parul BATRA, Ryan KO and Saurabh SANGHVI. Jobs lost, jobs gained: What the future of work will mean for jobs, skills, and wages. *McKinsey Global Institute* [online]. 28. 11. 2017 [retrieved on: 2020-10-06]. Available at: <https://www.mckinsey.com/featured-insights/future-of-work/jobs-lost-jobs-gained-what-the-future-of-work-will-mean-for-jobs-skills-and-wages>.

This does not mean that 51% of people will necessarily lose their jobs: for most employees, this will mean a significant change in the way they work, including learning ways to leverage data and use machines. For others, we foresee a significant shift in professions in favor of growing sectors, such as remote business services centers or social care for elderly people. Those shifts will require learning new skills, mostly technological and advanced cognitive capabilities (e.g., analytical capability, creativity), interpersonal skills, flexibility, and an ongoing ability to adjust to the changing needs of the dynamic labor market.<sup>23</sup>

A step change is required instead of marginal improvements if we are to provide an upskilling and re-skilling program for 20–30% of the workforce over the next decade. An ideal battery of interventions would:

- build awareness of the job transitions that will be required, developed together in close collaboration with industry
- set up a new platform for upskilling/re-skilling programs
- provide transparent evaluation of the results of various programs
- offer incentives for employees to participate in such programs, for example, a possible link between unemployment benefits and participation in courses

Within the ecosystem, a broad variety of programs offered by both public and private providers should be considered, ranging from traditional short courses (e.g., a welding course, driving course) to traditional academic programs (e.g., undergraduate or graduate degree). However, it is important that other “mid-size” qualifications are also offered. For instance, a multi-month UX design or 3D printing training is easier to graduate from and will also ensure its graduate a higher-value-adding job in the future.

Singapore incentivizes its citizens to participate in courses to improve their professional skills. In the *SkillsFuture* program, citizens can choose from a list of training courses in the fields of data analytics, finance, technical services, digital media, cybersecurity, entrepreneurship, advanced manufacturing, and urban solutions. Through an “Earn and Learn” scheme, employers receive up to ~EUR 9,000 to finance training initiatives for those starting their professions, particularly in technical occupations. In *SkillsFuture Credit*, all citizens over 25 receive around EUR 300 in their training account to take approved courses (currently over 21,000 courses on offer).<sup>24</sup>

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23) NOVAK, Jurica, Marcin PURTA, Tomasz MARCINIĄK, Karol IGNATOWICZ, Kacper ROZENBAUM and Kasper YEARWOOD. *The Rise of the Digital Challengers* [online]. 2018 [retrieved on: 2020-09-28]. Available at: [https://digitalchallengers.mckinsey.com/files/McKinsey%20CEE%20report\\_The%20Rise%20of%20Digital%20Challengers.pdf](https://digitalchallengers.mckinsey.com/files/McKinsey%20CEE%20report_The%20Rise%20of%20Digital%20Challengers.pdf).

24) *My Skills Future* [online]. [retrieved on: 2020-10-06]. Available at: <https://www.myskillsfuture.sg/content/portal/en/index.html>.

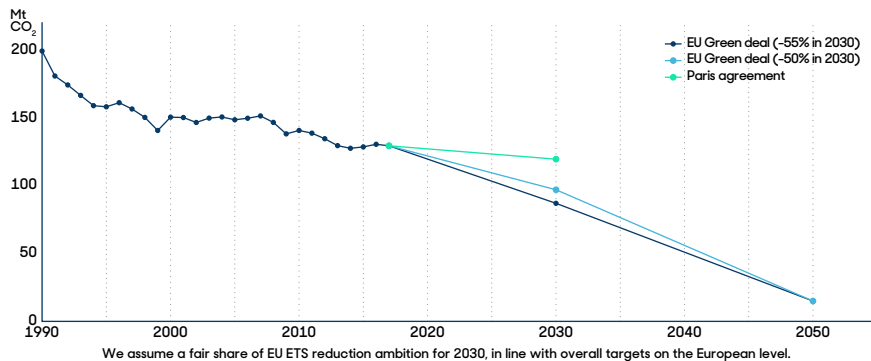
Turkey took re-skilling to the next level by launching ten “Model factories” that are focused on companies directly – the idea is to help transition companies to transition to Industry 4.0, enabling the digital transformation of facilities. The advantage of model factories is the experimental learning setup, which educates participants in an engaging way, rather than through traditional education approaches. Centers will offer applied training and consultancy services that will test and teach participants on the topic of lean manufacturing, digital transformations, product development, energy efficiency, and other issues.<sup>25</sup>

### Set an ambitious decarbonization goal

The European Commission announced the *European Green Deal* in December 2019 with the aim of radically curbing greenhouse gas (GHG) emissions. Member states would be required to reach net-zero emissions by 2050 and a ~55% reduction by 2030. For the EU to reach this target, all countries must do their part and accelerate emission reduction.

**Chart 10: Decreasing the greenhouse gas emissions in the Czech Republic**

Source: Report *Pathways to Decarbonize the Czech Republic* by McKinsey



Although GHG emissions in the Czech Republic have fallen in recent years, the country is still the fourth largest per-capita GHG emitter in the EU after Luxembourg, Estonia, and Ireland. The power sector is the largest contributor, accounting for 35% of GHG emissions, followed by industry, transport, buildings, agriculture, and waste. In contrast, the power and heat sector in Austria accounts only for 10% of their emissions.<sup>26</sup>

25) CAN, Metin. ‘Model Factories’ to be launched in 10 Turkish cities to ease technological transformation [online]. 27. 6. 2018 [retrieved on: 2020-09-28]. Available at: <https://www.dailysabah.com/technology/2018/06/27/model-factories-to-be-launched-in-10-turkish-cities-to-ease-technological-transformation>.

26) McKinsey analysis based on EUROSTAT data.

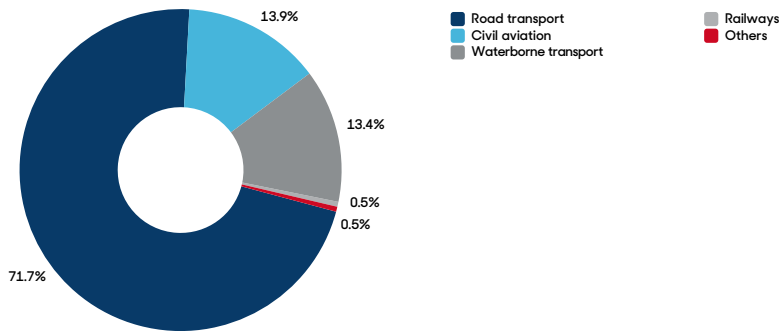
According to the McKinsey report *Pathways to Decarbonize the Czech Republic*, many of the required investments can be value creating. The most impactful levers to reach the interim target of GHG emissions reduction by 2030 include:

- transition from coal-fired power & heat generation
- scaling down coal mining and coal processing
- electrification of transportation
- efficiency improvement and transition from coal-fired heating in buildings
- electrification of industry.

While each country faces different challenges in power and heat generation and industry segments, a common challenge for all countries is the electrification of transportation. Transport is among the largest GHG emitters that are not subject to the EU *Emission Trading System* levers and so require additional regulation. Within transport, road vehicles contribute 72% of the GHG emissions.<sup>27</sup> Decarbonization requires country-wide reform and an ambitious goal to exceed 30% new electric vehicle sales by 2030 would help. For the Czech Republic and Slovakia, which have the largest automotive sector per capita globally, such a target can accelerate transformation and support industry competitiveness.

**Chart 11: Distribution of greenhouse gas emissions by transport type**

Source: Eurostat



Some countries, such as France, Germany, Netherlands, Sweden, and Norway, have already joined the *EV 30@30* campaign to reach 30% of electric vehicles sales by 2030.<sup>28</sup> The

27) EU transport in figures: Statistical pocketbook 2019. *European Commission* [online]. 11. 10. 2019 [retrieved on: 2020-10-06]. Available at: <https://op.europa.eu/en/publication-detail/-/publication/f0f3e1b7-ee2b-11e9-a32c-01aa75ed71a1>.

28) *New CEM campaign aims for goal of 30% new electric vehicle sales by 2030* [online]. 8. 6. 2017 [retrieved on: 2020-09-28]. Available at: <https://www.iea.org/news/new-цем-campaign-aims-for-goal-of-30-new-electric-vehicle-sales-by-2030>.



Czech Republic, considering the high average age of its car fleet<sup>29</sup> and large automotive industry, could even go beyond this target<sup>30</sup> and achieve 49% of share of BEV + PHEV sales in 2030, resulting in ~590k electric vehicles.

Government will play a critical role in developing and supporting the transition. Typically, governments support the market, for example:

- **Supporting the development of charging infrastructure.** It can mandate the building of charging points at administrative centers or shopping malls or allocate subsidies. Early adopters, such as Germany, Sweden, and the Netherlands have developed infrastructure and expect a mass EV (electric vehicle) adoption. The Czech Republic may need to build up to ~60,000 charge points by 2030, compared to the current 715.<sup>31</sup>
- **Supporting adoption through educational campaigns** to end customers on the benefits of electric vehicles and their environmental impact.
- **Purchasing EVs** for government institutions.
- **Providing non-monetary benefits** to accelerate adoption, such as dedicated parking spaces in the city, separate lanes on the road, or partial exemption of EVs from government congestion reduction policies (i.e., restrictions on vehicles entering the city center).
- **Selectively providing monetary benefits** for customers such as free EV charging, tax benefits, or even subsidies with the aim of accelerating the mobilization of private capital.

Reaching GHG emission neutrality will be a significant milestone, and electrification of transportation is part of the solution.

### **Improve health by prevention through primary care and telemedicine**

The pandemic and its repercussions are estimated to cause a 3%–8% drop in global GDP in 2020. Yet, we estimate that poor health reduced global GDP by 15% in 2017.<sup>32</sup>

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29) Average car fleet age according to ACEA, 2020: Austria 8.2 years, Czech Republic 14.8 years, Hungary 15.7 years, Poland 13.9 years, Slovakia 13.9 year, EU average 10.8 years.

30) *Pathways to Decarbonize the Czech Republic*, McKinsey report (published on 12 November 2020).

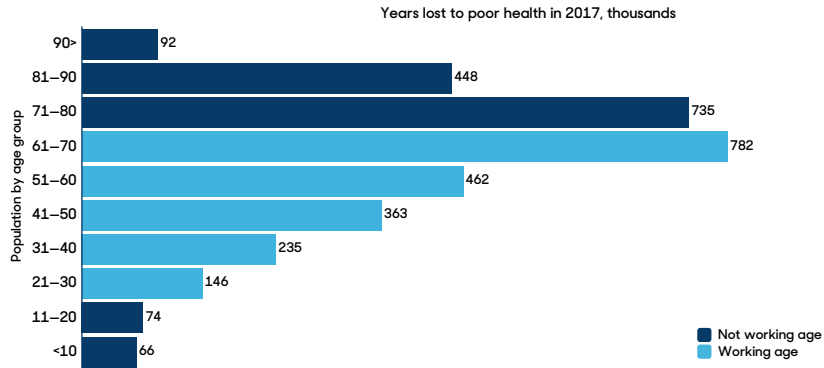
31) List of public charging points in the Czech Republic as of records from 31. 10. 2019. *Ministry of Industry and Trade* [online]. November 2019 [retrieved on: 2020-09-28]. Available at: [https://www.mpo.cz/assets/cz/energetika/statistika/statistika-cerpacich-stanic-pohonnnych-hmot/2019/11/Seznam\\_ver\\_DS\\_2019\\_10\\_31fin.pdf](https://www.mpo.cz/assets/cz/energetika/statistika/statistika-cerpacich-stanic-pohonnnych-hmot/2019/11/Seznam_ver_DS_2019_10_31fin.pdf).

32) REMES, Jaana, Katherine LINZER, Shubham SINGHAL, et al. Prioritizing health: A prescription for prosperity. *McKinsey* [online]. 8. 7. 2020 [retrieved on: 2020-09-28]. Available at: <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/prioritizing-health-a-prescription-for-prosperity>.

## Chart 12: Years lost to poor health in the Czech Republic

Source: Global Disease Burden Database 2016 IHME, World Bank, McKinsey Global Institute

analysis <sup>33</sup>



In the 20th century, life expectancy improved significantly. People live longer, but not necessarily in good health. In the Czech Republic, life expectancy improved by approximately two years between 2007 and 2017 (1.4 years in Austria). Nevertheless, another key indicator, healthy life years, actually worsened for both countries, declining by one year for the Czech Republic and three years in Austria.<sup>34</sup> Generally, 58% of the years lost to poor health occur in the working age, resulting in approximately USD 38 billion in lost economic output.<sup>35</sup>

Healthcare has come to the spotlight in the Covid-19 pandemic. Facing the multifaceted challenge, healthcare systems needed to secure Covid-19-related care, ensure personnel safety, and at the same time take care of other patients. Standard outpatient care has been significantly impacted by patients' inability to see their doctors in person. As a result, the use of telehealth accelerated massively. For example, in the US, adoption surged from 11% in 2019 to 46% in 2020, and 76% of people are interested in using telehealth solutions going forward.<sup>36</sup>

The next digital normal presents an opportunity to simultaneously improve the well-being of our population, boost our GDP, and improve the resilience of the healthcare systems. CE countries can capture immediate benefits by capitalizing on the telehealth trend to improve primary and preventive care – a large contributor to the overall population health.

33) *Life expectancy at birth by sex* [online]. [retrieved on: 2020-09-28]. Available at: [https://ec.europa.eu/eurostat/web/products-datasets/product?code=sdg\\_03\\_10](https://ec.europa.eu/eurostat/web/products-datasets/product?code=sdg_03_10).  
*Healthy life years at birth by sex* [online]. [retrieved on: 2020-09-28]. Available at: <https://ec.europa.eu/eurostat/web/products-datasets/-/tps00150>.

34) The Global Burden of Disease. *Open Learning Campus* [online]. [retrieved on: 2020-10-06]. Available at: <https://olc.worldbank.org/content/global-burden-disease>.

35) Materials for the report *Prioritizing health: A prescription for prosperity* by McKinsey Global Institute.

36) BESTSENNYY, Oleg, Greg GILBERT, Alex HARRIS and Jennifer ROST. Telehealth: A quarter-trillion-dollar post-COVID-19 reality? *McKinsey* [online]. 29. 5. 2020 [retrieved on: 2020-09-28]. Available at: <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/telehealth-a-quarter-trillion-dollar-post-covid-19-reality>.

## Chart 13: Telemedicine perspective for the Covid-19 pandemic

Source: McKinsey

### 1. Consumer



While the surge in telehealth has been driven by the immediate goal to avoid exposure to Covid-19, with more than 70% of in-person visits cancelled, 76% of survey respondents indicated they were highly or moderately likely to use telehealth going forward, and 74% of telehealth users reported high satisfaction.

### 2. Provider

Health systems, independent practices, behavioral health providers, and others rapidly scaled telehealth offerings to fill the gap between need and cancelled in-person care, and are reporting **50–175x** the number of telehealth visits pre-Covid.



In addition, **57%** of providers view telehealth more favorably than they did before Covid-19 and **64%** are more comfortable using it.

### 3. Regulatory

Types of services available for telehealth have greatly expanded, with the Centers for Medicare and Medicaid Services (CMS) temporarily approving more than **80 new services** and lifting restrictions on originating site, allowing Medicare Advantage plans to conduct risk assessments via telehealth, and adding other regulatory flexibilities to increase access to virtual care.

McKinsey Global Institute (MGI) argues for spending in favor of prevention to accelerate countries towards the goal of improved health. Prevention of diseases is typically less expensive than treatment and reduces the need for more expensive treatment later on, contributing to a high economic return. Fully capturing prevention benefits would bring USD 40 billion of additional economic benefit (a 14% increase) to the Czech GDP, or USD 51 billion (a 9% increase) to Austria's GDP.<sup>37</sup>

CE countries could embark on this journey with several key use cases that are possible to implement in the near future in our region:

- **Enable remote preventive care through telemedicine.** Patients can get information on how urgent the care and a physical visit to the provider actually is and how to proceed (consultation of symptoms, e-prescription, or advice on non-prescriptive drugs, with a physical visit recommended as needed). As a result, access to care in remote areas would improve and the burden on hospitals would be alleviated.
- **Monitor chronically ill and fragile patients through wearable sensors.** For example, wearable sensors can deliver information about heart rates, glucose levels, and oxygen saturation in real time. Chronic diseases, such as diabetes and hypertension, could thus be better controlled. The data could be used to learn about the progression of diseases and effective treatments, speeding up the research of effective treatments. As a result, prevention of complications would improve, raising

37) *Prioritizing health: A prescription for prosperity* [online]. [retrieved on: 2020-09-28]. Available at: <https://public.tableau.com/views/PrioritizingHealthAPrescriptionforprosperity/PrioritizingHealthAPrescriptionforprosperity?showVizHome=no&%3AshowVizHome=no#2>.

the quality of life. Admission rates and length of hospital stays would come down, with obvious benefits for healthcare costs and effectiveness.

- **Apply telemedicine and remote-patient monitoring in fighting the pandemic,** with multiple benefits for all involved stakeholders: doctors can treat multiple patients at the same time, patients can feel safe staying home, and reduced hospitalization relieves hospital capacity.
- **Promote remote monitoring across hospitals.** Leverage technology to increase the efficiency and service ratio in the hospital network: use remote monitoring technologies to match demand and supply for specialists, intensivists, and other broader hospital staff to reduce need for patient transfers.

For example, the digitization of British healthcare, has led to significant progress. Digital services like a health portal with an appointment booking system for primary care and a light version of an electronic health record have been implemented nationwide. A key initiative to drive health innovations in the UK is the *NHS Innovation Accelerator*, founded in 2015, which searches for pioneering healthcare innovations that can be implemented nationwide. An example of such an innovator is *Babylon*, one of the UK's best-funded digital healthcare start-ups providing teleconsultations and AI-powered patient triaging. *Babylon* plans to launch “AI to predict disease”, using machine learning to assess an individual's health profile and suggest possible future illnesses, and monitoring data usage to identify mental health deterioration.

### **Strengthen key transport infrastructure by accelerating projects**

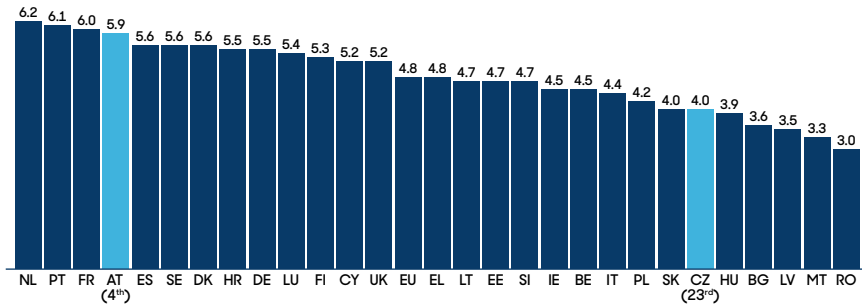
Transport has always been a key enabler of economic growth. It connects supply chains, creating better opportunities for employment, education, healthcare, and multiple other sectors. Two of the most important components of transport infrastructure are the density and quality of the road and railway network. According to WEF's *Global Competitiveness Report*, the biggest differences among CE countries are in the quality and density of roads: for example, while Austria ranked fourth in the EU and the Czech Republic reached only 23<sup>rd</sup> place.<sup>38</sup>

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38) *Czechia - Investments and Infrastructure* [online]. [retrieved on: 2020-09-28]. Available at: [https://ec.europa.eu/transport/facts-fundings/scoreboard/countries/czechia/investments-infrastructure\\_en](https://ec.europa.eu/transport/facts-fundings/scoreboard/countries/czechia/investments-infrastructure_en).

## Chart 14: Quality of roads

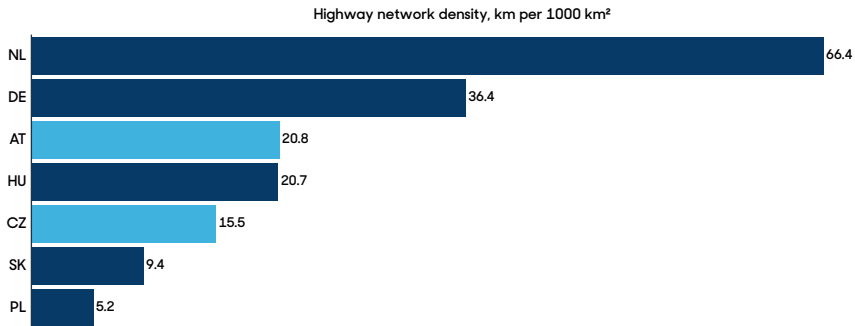
Source: Eurostat



Both the Czech Republic and Austria could also improve in the area of highway network density. The countries are lagging behind the best in the EU, such as the Netherlands, with 66.4 km of highways per 1,000 km<sup>2</sup>. Even a large country such as Germany has achieved a density of 36.4, significantly more than 20.8 in Austria or 15.5 in the Czech Republic.<sup>39</sup>

## Chart 15: Density of highways

Source: Eurostat



A key driver of this indicator is the speed of building highways, where projects normally take over ten years. It is essential to accelerate the process of building high-quality highways – end-to-end, from the moment a decision is made to build a new segment of highways, over getting the required permissions, up to the opening celebration.

Success stories start with defining an ambitious goal. The Czech Republic currently has a plan to double its highways infrastructure by constructing 800 km of highways by

<sup>39)</sup> *Transport in the European Union: Current Trends and Issues* [online]. March 2019 [retrieved on: 2020-09-28]. Available at: <https://ec.europa.eu/transport/sites/transport/files/2019-transport-in-the-eu-current-trends-and-issues.pdf>.

2050. What would it take to achieve this goal in half of the time, constructing on average 55 km per year vs. the planned 27 km? This goal could be realistic if several levers are applied simultaneously:

- **Pass a special law:** Italy, for example, was able to rebuild the Genoa bridge only in 15 months after beginning the construction and two years after the demolition of the previously failed bridge. A project of such size could take around 14 years due to cost-focused tenders that often make projects uneconomical to construction firms and lengthy appeals processes. In the Genoa case, there were no appeals, and the project was built “at the right costs and the right way”.<sup>40</sup> Special laws could accelerate not only the land expropriation process for strategic infrastructure projects (such as the *Ley de Expropiación Forzosa* in Spain), but also improve the selection process.
- **Improve contracting:** Economic theory teaches us that repeated tenders among few participants can easily result in oligopolistic behavior that escalates costs and reduces quality. To ensure the full benefits of competition, significantly larger sections of the highways could be tendered. For example, tendering a 100-km section instead of 10 km would force competitors to go “all in” and also attract companies not currently in the market. In addition, economies of scale can allow current and potential competitors to develop their supply chains for subcontractors and building material. The approach needs to go hand-in-hand with high-quality contracts with a clear set of KPIs, correctly assigned rights and liabilities, and speedy conflict-resolution mechanisms.
- **Empower a central building authority:** For example, gas pipeline construction is controlled by a central building authority, and the development process takes only two years. Central decision-making can also be subject to better transparency and increased competition by attracting larger, multinational engineering and construction players with the necessary skills, resources, and experience. An alternative would be to **review the tasks delegated to municipalities**, which are currently heavily involved in the development of highways. The Czech Republic stands out by having a very high number of municipalities: According to the OECD study on municipal fragmentation and economic performance,<sup>41</sup> in 2012, the Czech Republic had the highest degree of fragmentation out of the 25 countries analyzed in the study, with 6,253 municipalities on the local level. In contrast, Denmark implemented a Structural Reform

40) MONELLA, Lillo Montalto. How did Italy manage to build a replacement Genoa bridge so quickly? *Euronews* [online]. 3. 8. 2020 [retrieved on: 2020-09-28]. Available at: <https://www.euronews.com/2020/08/03/how-did-italy-manage-to-build-a-replacement-genoa-bridge-so-quickly>.

41) Municipal Fragmentation and Economic Performance of OECD TL2 Regions. *OECD Regional Development Working Papers* [online]. [retrieved on: 2020-09-28]. Available at: [https://www.oecd-ilibrary.org/urban-rural-and-regional-development/municipal-fragmentation-and-economic-performance-of-oecd-tl2-regions\\_5jrxqs60st5h-en;jsessionid=fNOJA4y1\\_SLLw6HT-UCWGQSt.ip-10-240-5-33](https://www.oecd-ilibrary.org/urban-rural-and-regional-development/municipal-fragmentation-and-economic-performance-of-oecd-tl2-regions_5jrxqs60st5h-en;jsessionid=fNOJA4y1_SLLw6HT-UCWGQSt.ip-10-240-5-33).

in 2007, reducing the number of municipalities from 271 to 98, and also rearranged the distribution of tasks, with roads newly included under the agenda of municipalities.<sup>42</sup>

While we are not calling for merging local municipalities, their tasks should be reviewed in light of “minimal economic scale” and appropriate incentives created to shift tasks with economies of scale and skill to higher levels.

- **Examine the possibility of PPP (Public Private Partnership) projects:** A private investor would, in all probability, achieve a higher speed of highway development due to a net present value focus. A total cost of ownership view means the private owner would also better optimize between investments in the road and future maintenance costs. As there are numerous types of concession contracts, PPP does not necessarily imply that the road will be tolled.
- **Follow *design to value* (DtV) principles** in the design phase of planning the highway network: Such an approach includes constant evaluation and comparison between what drives customer value and cost drivers. The process starts with conducting a customer value analysis – which, in the context of transport infrastructure, means man-years of travel time saved or road accidents prevented. Consequently, cost positions are analyzed and cost reduction ideas are generated. DtV is a powerful principle, which aligns the ratio of benefits to costs of different projects and project components and ultimately allows more to be built for less.

*As Albert Einstein said, in the midst of every crisis lies a great opportunity. Due to the Covid-19 pandemic, the gap between the winners and losers – both in the private and public sectors – is widening at unprecedented speeds. Due to their relative similarity, CE countries should boost their collaboration efforts to solve the most critical questions ahead: questions related to digitization, education, re-skilling, environmental protection, healthcare, and infrastructure. The set of topics is unifying and answers will be country-specific; however, countries should serve as a potential source of inspiration for each other. CE countries can hopefully emerge stronger in the post-Covid next normal.*

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42) Structural Reform. *Ministry of Social Affairs and the Interior* [online]. [retrieved on: 2020-09-28]. Available at: <https://english.sim.dk/responsibilities-of-the-ministry/economics-of-municipalities-and-regions/structural-reform/>.

# City Strategies – Getting Back to the Next Normal

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Prepared for the annual conference of the Aspen Institute CE.

Cities seem to be the laboratories of change – particularly in view of the recent Covid-19 pandemic. Hit harder by the pandemic and spurred by dramatic life changes during lockdowns, Central European capitals can show the way forward for the rest of their countries. Cities can help us understand changing needs and find and prototype future solutions. As a result, cities may not only improve the lives of their inhabitants but also lead innovation in their countries and with central governments.

In this article, we first focus on the changes the Covid-19 pandemic and lockdowns have imposed on cities. Then, in the context of the overall Central European priority topics, we zoom in on three areas in which cities can act as inspiring leaders for the rest of their countries.

## **Cities Lead Change in Good and Bad Times**

Traditionally, cities are centers of economic activity, places of condensed civilization, intense consumption, and new innovative solutions. The capitals of Central European countries all account for a disproportionate share of economic activity, wealth, and innovation.

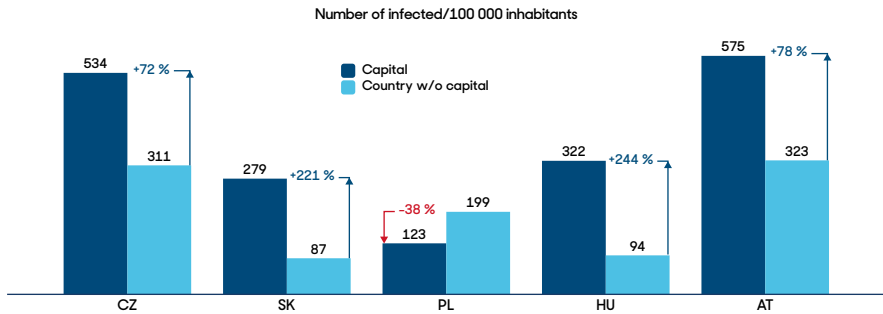
In the past few months, though, cities have become the center of spreading Covid-19. The reasons are evident: density of population and difficulty of physical distancing in areas like public transport. Similar to other regions, the first wave of the Covid-19 pandemic struck urban areas at first and Central European countries registered significantly more infected per capita in capital cities compared to the rest of the country. At the time of writing



(mid-September 2020), Budapest, for example, has seen almost three to four times more infections per 100,000 residents, compared to the rest of the country. The exception was Poland, which had its local epicenter in Upper Silesia.<sup>1</sup>

### Chart 1: Number of infected in capital vs rest of the country

Source: National statistical services & Ministries of Health of the Czech Republic, Slovakia, Hungary, Poland, and Austria



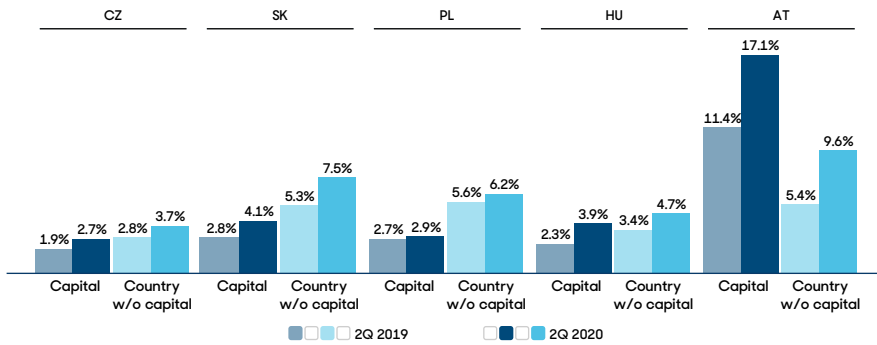
The pandemic and ensuing lockdowns have had a considerable impact on cities across Central Europe, particularly in terms of unemployment. Still, the majority of Central European capitals exhibited surprising resilience to the crisis. The capitals of the Czech Republic, Slovakia, and Poland all enjoyed not only lower unemployment but also better unemployment development than the rest of their respective countries.<sup>2</sup> The notable exception was Vienna, which was the hardest hit and experienced unemployment rising by 5.7pp in Q2 2020 year-over-year and reaching 17.1% – nearly double than in the rest of Austria. This is probably linked to the role Vienna plays as a regional business and transport hub as well as experiencing an earlier onset of the pandemic as compared to the other Central European capitals.

1) McKinsey analysis based on data provided by national statistical services & Ministries of Health of the Czech Republic, Slovakia, Hungary, Poland, and Austria.

2) McKinsey analysis based on data provided by Ministry of Labor and Social Affairs of the Czech Republic, Hungarian Central Statistical Office, Polish Statistical Office, Ministry of Labor, Social Affairs and Family of Slovakia.

## Chart 2: Unemployment rates in capitals vs the rest of the country

Source: Ministry of Labor and Social Affairs of the Czech Republic, Hungarian Central Statistical Office, Polish Statistical Office, Ministry of Labor, Social Affairs and Family of Slovakia.



## Covid-19 as an Accelerator of Change (Not Only) in Cities

Despite the human and economic costs, the lockdown has brought some positive changes to cities. The urban population in Central Europe, for the first time, did not have to face traffic jams or commutes on overcrowded public transport. For two months, streets and roads were emptied, and the cities enjoyed higher air quality.

The overall volume of cars in the streets decreased between 30% and 50% during the lockdown. In Prague, traffic in transit arteries like V Holesovickach decreased by 30% while congestion spots in the center (e.g., Nabrezi Ludvika Svobody) had a 50% traffic reduction.<sup>3</sup> In Warsaw, the Romana Dmowskiego roundabout, where 100,000 cars pass daily, saw a 40% drop in traffic following the state of emergency.<sup>4</sup> Public transport usage was also seriously impacted; in Prague, the underground utilization fell nearly five-fold.<sup>5</sup>

The traffic decrease clearly demonstrated the link between traffic and air quality. The NO<sub>2</sub> concentration levels in Prague fell by 8% during weekdays and 23% during weekends during the lockdown (mid-March through mid-April 2020), compared to the five-year average.<sup>6</sup>

- LUDVÍK, Matěj. In lockdown, Prague experienced a one-third drop in the number of vehicles, also peak hours changed. *Idnes.cz* [online]. 4. 4. 2020 [retrieved on: 2020-10-08]. Available at: [https://www.idnes.cz/praha/zpravy/doprava-v-praze-ubyla-karantena-koronavirus-praha.A200401\\_541886\\_praha-zpravy\\_rsr](https://www.idnes.cz/praha/zpravy/doprava-v-praze-ubyla-karantena-koronavirus-praha.A200401_541886_praha-zpravy_rsr).
- Mały ruch na drogach* [online]. 27. 3. 2020 [retrieved on: 2020-09-29]. Available at: <https://zdm.waw.pl/aktualnosci/mały-ruch-na-drogach/>.
- Drop in the number of passengers transported by almost three-fourths, increase in the number of employees quarantined – Therefore, transport authorities MHMP, DPP and ROPID started to operate on holiday schedule. *Dopravní podnik hlavního města Prahy* [online]. 18. 3. 2020 [retrieved on: 2020-10-06]. Available at: [https://www.dpp.cz/spolecnost/pro-media/tiskove-zpravy/detail/278\\_1068-pokles-prepravenych-cestujicich-o-temer-tri-ctvrtiny-rust-poctu-zamestnancu-v-karantene-mhmp-dpp-a-ropid-proti-v-prazske-mhd-zavadi-prazdninovy-jizdni-rad](https://www.dpp.cz/spolecnost/pro-media/tiskove-zpravy/detail/278_1068-pokles-prepravenych-cestujicich-o-temer-tri-ctvrtiny-rust-poctu-zamestnancu-v-karantene-mhmp-dpp-a-ropid-proti-v-prazske-mhd-zavadi-prazdninovy-jizdni-rad).
- SCHREIBEROVÁ, Markéta, Hana ŠKÁČHOVÁ, Leona VLASÁKOVÁ and Lenka CRHOVÁ. *Změna kvality ovzduší na území České republiky v době nouzového stavu (Changes in air quality at the territory of the Czech Republic during lockdown)* [online]. [retrieved on: 2020-09-29]. Available at: [http://portal.chmi.cz/files/portal/docs/tiskove\\_zpravy/2020/COVID\\_ZPRAVA.pdf](http://portal.chmi.cz/files/portal/docs/tiskove_zpravy/2020/COVID_ZPRAVA.pdf).

Temporary improvement in certain aspects of the quality of life provide inspiration for the post-Covid next normal. Even before Covid-19, we already saw long-term improvements in Central European capitals (e.g., in life expectancy, road traffic accidents, and education). In terms of quality of life, Central European capitals already outperform numerous Western cities, for example, Dubai, Los Angeles, and Brussels. However, there still is a gap to bridge in order to reach Western European cities with the highest quality of life. For example, Zurich still outperforms Central European capitals in life expectancy, overall safety, air quality, and road safety (with the exception of Vienna, which is a top performer in terms of road safety).<sup>7</sup>

### Chart 3: Quality of life comparison

Source: McKinsey analysis based on data provided by IQAir and GlobalResidenceIndex

	Prague	Bratislava	Warsaw	Budapest	Wien	Zurich	Dubai	Los Angeles	Brussels
Life expectancy - At birth 2018/ change since 2001	80.8/ +4.1	78.8/ +3.7		78.4/ +4.6	80.6/ +2.6	84/ +3.8	77.8/ +3.3	82.5/ -	81.5/ +3.4
Safety index, 2019	80	73	83	76	76	90	81	60	70
Air Pollution - Average 2019 concentration of PM2.5 µg/m <sup>3</sup>	12	14	17	14	12	11	41	13	14
Victims in road accidents - 2014-18 average, per 100,000 population/change compared to 2009-13 average	2.13/ -1.07	4.26/ -0.26		2.96/ -	0.99/ -0.46	1.77/ -0.91	4.94/ +0.70	6.32/ -	2.00/ -0.62
Population with tertiary education - On population from 25 to 64 years of age, 2019/ change since 2013						54.3/ +9.2	-	-	47.1/ +5.6

Taking into account the needs arising from the Covid-19 crisis, we have singled out three areas in which Central European cities can act as role models to their countries. These three areas also have great potential to close the gap in quality-of-life to Western European cities:

- Digitization of public services and implementation of smart city features
- Support for active mobility (e.g. cycling) and multimodal means of transport
- Environmental protection, in particular in the context of district heating decarbonization

On the following pages, we dive deep into each of these areas and show international examples in order to stimulate debate about the role Central European capitals can play in shaping the next digital normal.

7) McKinsey Analysis based on data provided by IQAir and GlobalResidenceIndex.

## Improve City Experience with an All-in-One App

We define a smart city as one in which different parties use digital technology to solve public problems and achieve a higher quality of life. Smart city applications can integrate multiple dimensions of public sphere, such as security, healthcare, energy, water, mobility, economic development and housing, or engagement in public and community issues. The best of these applications directly impact quality of life. A great example are intelligent traffic signals that not only reduce commute time and GHG emissions but also shorten emergency response time and fatalities.<sup>8</sup>

Dubai is one of the most prominent pioneers of the smart city concept. While Dubai's approach to city planning, development, and management is hardly replicable in Europe and Dubai does not score well in many other quality-of-life indicators, selected elements can be a source of inspiration. According to Sheikh Hamdan, the Crown Prince of Dubai, technology can be used as "a key to a balanced and happy life." He said this when announcing the plan to develop Dubai into a smart city, pledging to turn it 100% digital within four years, with the Dubai Government issuing "its last paper transaction in 2021."<sup>9</sup>

A key component of *Smart Dubai* is *DubaiNow*, a smartphone app that is part of the wider government vision to go paper-free by 2021. It is a one-stop-shop smartphone application launched in 2017 for Dubai residents that provides digital access to more than 120 services across ten key areas.<sup>10</sup> Interestingly enough, besides digitizing public and city services, *DubaiNow* created a digital services ecosystem by integrating the services of a number of private companies.

The services in *DubaiNow* relate to the day-to-day needs of Dubai residents: paying local bills, renewing car registrations, settling traffic fines, checking children's vaccinations, locating a doctor, or applying for permanent residency. According to official city data, between March and May 2020, the application has processed 700,000 transactions worth AED 358 million.<sup>11</sup>

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- 8) WOETZEL, Jonathan, Jaana REMES, Brodie BOLAND, et al. Smart cities: Digital solutions for a more livable future. *McKinsey* [online]. 5. 6. 2018 [retrieved on: 2020-10-06]. Available at: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/smart-cities-digital-solutions-for-a-more-livable-future>.
  - 9) BALDWIN, Derek. Dubai unveils plan to go paperless by 2021. *Gulf News* [online]. 16. 4. 2017 [retrieved on: 2020-09-29]. Available at: <https://gulfnews.com/uae/government/dubai-unveils-plan-to-go-paperless-by-2021-1.2012405>.
  - 10) *Smart Dubai* [online]. [retrieved on: 2020-09-28]. Available at: <https://www.smartdubai.ae/apps-services/details/dubai-now>.
  - 11) DubaiNow Application Processes 700,000 Transactions Worth AED 358 Million in 3 Months. *Gulf News* [online]. 2. 7. 2020 [retrieved on: 2020-09-29]. Available at: <https://www.smartdubai.ae/newsroom/news/dubainow-application-processes-700-000-transactions-worth-aed-358-million-in-3-months>.

Several core principles, applicable also to Central European capitals, have contributed to the success of *DubaiNow*.

- **Mobile-first strategy:** *DubaiNow* has primarily been developed for smartphones (iOS and Android) to cater to the broadest possible range of occasions and facilitate convenience of use. While a PC version exists, it is not actively advertised.
- **Common front end for all services:** The app currently integrates services from over 30 entities while ensuring a common interface and a single logic for building customer journeys.
- **Focus on user experience:** The app supports dashboard personalization so users can view only those services that are relevant to them. In addition, users are encouraged to give feedback on various services. Dubai has also launched a separate *Happiness Meter* app to gather even broader feedback on the quality of life in Dubai.
- **Digital identity:** The authentication process is based on a legally accepted nationwide digital signature app, *UAE Pass*, that citizens use to digitally sign documents and access government and other city services. The *UAE Pass* is a critical enabler in a successful effort to digitize government services and digitize contracts.<sup>12</sup>
- **Development platform:** Dubai OS is the underlying platform, enabling a continuous integration of multiple services. Its design uses clear visualizations to ensure consistency within the app while minimizing the usage of coding during development.

*Smart Dubai's* officials believe that, due to the digital readiness of the city, there has been only minimal disruption of public services caused by the Covid-19 pandemic.<sup>13</sup> The principles behind the *DubaiNow* app are not only applicable in the EU, but we know of governments that have embarked on similarly ambitious efforts. For Central European cities, such an approach could cut through the complexity of numerous applications, disparate data sources, and legacy customer journeys. Most (though not all) parts are possible to implement within the current decision-making power of city authorities.

## Improve Public Health and Happiness by Active Mobility

City mobility needs to optimize for many variables – time, financial costs, safety, accessibility, and impact on the environment and public health. The preference for urban transport is a long-established urban planning paradigm in Central European cities. However,

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12) AL-AZZAWI, Ali and Hamad AL AWADHI. *Covid-19 City Experience Resilience & Impact Report* [online]. [retrieved on: 2020-09-29]. Available at: [https://www.smartdubai.ae/docs/default-source/publications/covid-19-city-experience-resilience-impact-report.pdf?sfvrsn=9a889de9\\_14](https://www.smartdubai.ae/docs/default-source/publications/covid-19-city-experience-resilience-impact-report.pdf?sfvrsn=9a889de9_14).

13) *Smart Dubai* [online]. [retrieved on: 2020-09-28]. Available at: <https://www.smartdubai.ae/apps-services/details/dubai-now>.

the pandemic introduced new considerations for travelers, imposing the risk of infection as a previously unknown cost on all means of mass transport.

Luckily, cities already have many transportation options at their disposal, and technological development constantly adds new ones. A decade or two ago, not many people would have bet on the mass popularity that bicycle- or scooter-sharing schemes seem to be gaining.

One type of mobility that stands out in city planning is active mobility. It is defined as transport based on human physical activity only, i.e., without any motorized means. The most common forms include walking and cycling. If a person has all needed services nearby, the reduction in car traffic would have a positive impact on the air quality, carbon footprint, and the overall traffic situation in the city. Active mobility also improves health – not only curtailing Covid-19 and other infections, but via the impact on the environment and immunity. It also contributes to a reduction in non-communicable diseases (e.g., diabetes and circulatory diseases). Cities around the world have embraced active mobility in their anti-Covid efforts. For example, Bogota, Colombia, recently added 76 km of bicycle lanes. In Oakland, California, the city transformed 120 km of roads to pedestrian or cycling zones – all to support social distancing.<sup>14</sup>

However, active mobility delivers its full potential only when it is embedded in urban planning from the outset. A great example of a district supporting active mobility is the Warsaw district Wilanów. This district ranks among the most successful in Poland, with the second-lowest unemployment rate (1.3%, 2018), the highest life expectancy, and the lowest obesity rate of all Warsaw districts. There is also a remarkable data pattern of the highest birth rate in Poland (22 per 1000 inhabitants, 2018) with the highest share of women with tertiary education<sup>15</sup> – statistics that are typically negatively, not positively, correlated. Apart from a higher share of younger adults in the population, urbanists find an explanation in the layout of this district – nearly all services are within a walkable distance, including shops and services, schools for all ages, kindergartens and playgrounds, which implies a lower time burden for parents.

New district developers and also local politicians can find inspiration in Wilanów. Findings can also be applied to already existing districts – for example, by retrofitting existing spaces to recreate landscapes and creating a better balance of activities in the neighborhood, or redesigning pedestrian and cycling zones. An alternative lever to encourage

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14) HAUSLER, Saskia, Kersten HEINEKE, Russell HENSLEY, Timo MÖLLER, Dennis SCHWEDHELM and Pei SHEN. The impact of COVID-19 on future mobility solutions. *McKinsey Center for Future Mobility* [online]. 4. 5. 2020 [retrieved on: 2020-09-29]. Available at: <https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-impact-of-covid-19-on-future-mobility-solutions>.

15) Panorama of Warsaw districts in 2018. *Statistical Office in Warszawa* [online]. 31. 12. 2019 [retrieved on: 2020-10-06]. Available at: <https://warszawa.stat.gov.pl/en/publications/others/panorama-of-warsaw-districts-in-2018,1,15.html>.

active mobility is to ensure that laws sufficiently protect pedestrians and cyclists. Another consideration is geofencing in urban areas to control how fast and where vehicles can travel.

## Make City Transport More Effective by Going Multimodal

Active mobility is not suitable for every journey around the city. Sometimes, inhabitants need to travel faster, go longer distances, or get around in unfavorable weather conditions. In these cases, multimodal transport represents an effective solution that cities should promote. Multimodal transportation allows seamless connectivity between a range of transport options like buses, trams, trains, and also walking, cycling, riding a scooter, etc.<sup>16</sup>

How do governments motivate people to leave the comfort of their cars and switch to multimodal transport? The answer is convenience, costs, sustainability, and creating real-time mobility systems, where the user is in control.<sup>17</sup> However, to make multimodal mobility appealing to most users, there needs to be a one-stop-shop for all city transportation options such as trams, bicycles, trains, buses, shared cars, and scooters. This integrated solution (Mobility as a Service – MaaS) needs to create a single seamless journey based on real-time data, allowing reliable planning and supporting different payment options.

The shift towards multimodal mobility has been shaped by both pre- and post-Covid trends. Lower consumer reliance on private car ownership, flexibility, and sustainability are complemented by technology-enabled options, such as car sharing, car-pooling, the emergence of e-scooter and e-bike providers, and the application of AI to transport management and planning. Furthermore, Covid-19 has had a significant impact on the transport and automotive sectors. This year, a rapid fall of 22% in global car sales is expected, while bicycle use is increasing. London, Milan, and Seattle are making new cycle lanes permanent, and New Yorkers' bike use is up over 50%.<sup>18</sup>

For multimodal mobility to achieve its potential, it needs to be developed in close collaboration between transportation providers, city planners, payment solution providers, and other stakeholders. Digitization, in particular open data and open API, can help develop and perfect new and existing customer services related to mobility. For instance,

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16) LAWRENCE, Cate and Jochen SCHWAB. Multimodal Mobility is Creating People-centric Transport. *Intelligent Mobility Xperience* [online]. 3. 3. 2020 [retrieved on: 2020-09-29]. Available at: <https://www.intelligent-mobility-xperience.com/multimodal-mobility-is-creating-people-centric-transport-a-908656/>.

17) Moving towards multimodality with Mobility as a Service. *Sustain Europe* [online]. 28. 10. 2019 [retrieved on: 2020-09-29]. Available at <https://www.sustaineurope.com/moving-towards-multimodality-with-mobility-as-a-service-20191028.html>.

18) DOMKE, Christoph and Quentin POTTS. Multimodal mobility is a transportation revolution. *Automotive World* [online]. 23. 6. 2020 [retrieved on: 2020-09-29]. Available at: <https://www.automotiveworld.com/articles/multimodal-mobility-is-a-transportation-revolution/>.

Transport for London (TfL) provides its API to more than 17,000 developers, and its data is leveraged in more than 600 apps that create many customer services.<sup>19</sup>

There are numerous opportunities to expand or develop this ecosystem, such as:

- Using digital signage or mobile apps to deliver real-time information about delays to enable riders to adjust their routes on the fly
- Installing IoT (Internet of Things) sensors on existing physical infrastructure to help crews perform predictive maintenance and fix problems before they turn into breakdowns and delays
- Collecting and analyzing data on public transit use and traffic to help cities make better decisions about implementing new bus routes
- Installing traffic signals and turn lanes
- Adding bike lanes

Many urban transit systems, such as those in Houston and London, are starting to go ticketless with digital payment systems. Some are going a step further by offering flat-rate mobility subscriptions that cover multiple modes of transportation.<sup>20</sup>

A number of world cities are currently working on MaaS solutions, an example being the *Smart Ways to Antwerp* (SWtA) project, which aims to provide users with possible journeys combining different modes of transportation, including cars, public transport, shared bikes, and walking, either on a website or a dedicated app. Another solution is the *Whim* mobile app, available in several European cities and expanding to the U.S. This MaaS offers a subscription service for public transportation, bike rentals, ridesharing, scooter rentals, taxis, or car rentals. Customers can opt for an all-inclusive package for EUR 499 a month with unlimited use of services.<sup>21</sup> MaaS solutions are already being rolled out in Central Europe. A Prague app called *Citymove* is able to compare the expected time and price of city transportation options, including shared scooters. The single point of access to mobility nudges drivers to prefer public transport by offering transparency about the travel time each type of service requires.

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19) LAWRENCE, Cate and Jochen SCHWAB. Multimodal Mobility is Creating People-centric Transport. *Intelligent Mobility Xperience* [online]. 3. 3. 2020 [retrieved on: 2020-09-29]. Available at: <https://www.intelligent-mobility-xperience.com/multimodal-mobility-is-creating-people-centric-transport-a-908656/>.

20) WOETZEL, Jonathan, Jaana REMES, Brodie BOLAND, et al. Smart cities: Digital solutions for a more livable future. *McKinsey* [online]. 5. 6. 2018 [retrieved on: 2020-10-06]. Available at: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/smart-cities-digital-solutions-for-a-more-livable-future>.

21) *Whim* [online]. [retrieved on: 2020-09-29]. Available at: <https://whimapp.com/>.

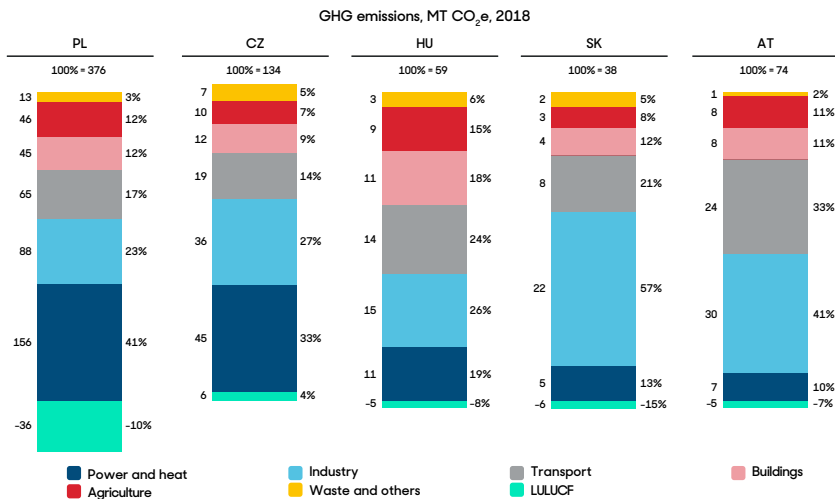


## Protect the Environment with a Long-Term Heating Plan

Heating is essential for cities' residents. Having a city vision for district heating (DH) can help reduce greenhouse gas (GHG) emissions, so citizens enjoy better air quality. For Central European countries, power and heat is within the top three GHG-emitting sectors.<sup>22</sup> Apart from GHG emissions, DH can also release gases such as CO or NOx, which cause air pollution and negatively influence citizens' health and well-being.

Chart 4: Distribution of GHG emissions in V4 countries and Austria

Source: Eurostat



Most city households are severely constrained in choosing how to satisfy their heating needs. In many cases, no carbon-efficient alternatives to DH exist. Households might not be able to install an alternative heating solution, or the switch is not economical (e.g., due to the consumption pattern profile). Even when households do have alternatives to DH, such as gas heating in houses, uncoordinated switching away from district heating might not be desirable. As the DH customer base decreases, the unit economics worsens, which can cause the entire system to unravel in a self-reinforcing spiral. As a result, the city may become more polluted without reducing GHG emissions – a clearly inferior outcome to the planned deployment of decarbonized alternatives.

<sup>22</sup> Greenhouse gas emissions by source sector (source: EEA). Eurostat [online]. [retrieved on: 2020-10-06]. Available at: [https://data.europa.eu/euodp/cs/data/dataset/pul4t\]iixpN9RNrly384g](https://data.europa.eu/euodp/cs/data/dataset/pul4t]iixpN9RNrly384g).

Currently, decisions are not fully in the hands of Central European cities. Heat sources and heat distribution networks are often privately held. Furthermore, these industries are typically regulated by a centralized energy regulator.

In this complex setting, cities need to develop a long-term vision for their district heating, i.e. answer the following questions:

- How to keep the current DH but reduce energy losses in the network and decarbonize the energy source. Specifically, cities that rely on coal sources (mainly in the Czech Republic and Poland) need to figure out how to use gas as a transition technology. Beyond that, waste-to-energy provides an alternative (e.g., the primary energy in an Austrian DH system is provided by 45% biomass and ~8% residual waste).<sup>23</sup>
- How to use hybrid solutions, such as integrating energy sources like heat pumps or clean fuel (e.g., hydrogen) boilers into the heat exchange stations on the DH network.
- How to plan for local decarbonized solutions, such as heat pumps or clean fuel (e.g., hydrogen) local boilers.

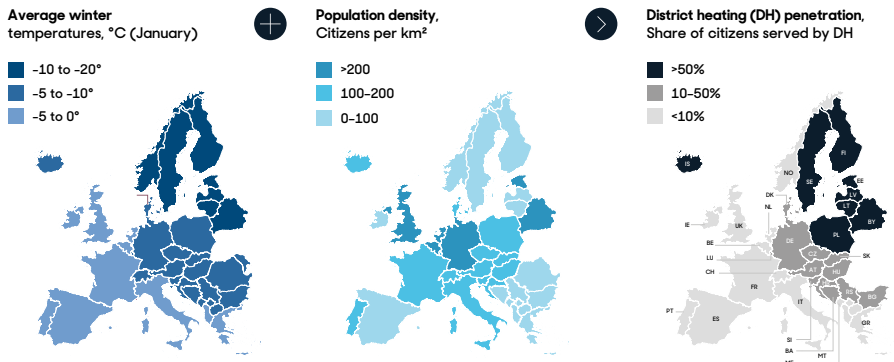
There is no one-size-fits-all solution to district heating, which is why the solution needs to be developed through the city agenda. The plan needs to be developed considering climate, because DH penetration is closely linked with average winter temperatures; population density; urban development (e.g., technology applicability in historic city centers), and the already developed DH infrastructure.

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23) *KeepWarm* [online]. [retrieved on: 2020-09-29]. Available at: <https://keepwarmeurope.eu/countries-in-focus/austria/english/>.

## Chart 5: District heating penetration

Source: McKinsey



District heating was not developed in Norway, due to availability of natural gas, which enabled low cost and environmentally friendly local heating.

The plan for DH development, similar to long-term land-use plans, should coordinate the interests of all stakeholders. It can create long-term stability and outlook for the private investor. Furthermore, stability can lead to competition development or public-private co-operation. By standing up to the challenge and defining the DH vision, cities can reduce GHG emissions, provide stability within the DH industry, and improve well-being for its citizens.

*The Covid-19 crisis has taught us many lessons; one is that change can be accomplished much faster than people may have imagined, both in public and private matters. Digital transformations around the world have progressed at unprecedented speeds in the last months, and Central European capitals can play a pivotal role in the current ongoing societal transformation. Cities, already laboratories of change and pioneers of new solutions, can aspire to be role models that set standards and pave the way for other areas to improve.*

*In light of recent events, cities should accelerate digitization efforts and smart city initiatives; embrace active mobility; and optimize public transport through modern, multimodal approaches. They should improve citizens' health by shifting to more ecological solutions. These initiatives could contribute to the ultimate goal of happy, healthy citizens who are living fulfilling and balanced lives.*

# Defense & Space: Opportunities for Science and Industry

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This text was produced based on source materials provided  
by the Czech Ministry of Defense and with the help of **Ladislav Stahl** and **Jan Lukačević**.

An increasing number of companies and research teams are participating in international space projects. NATO has recently recognized space as one of its operational domains and the Czech military has also started developing its own capabilities in this area. Space technology, both civilian and military, may be what the Czech Republic needs to move away from being the “assembly plant” of Europe and join the ranks of advanced developed countries. It can also boost the country’s security and help meet the country’s commitments to allies.

## Introduction

While the Czech Republic managed to sign some important military procurement contracts last year and increased its defense spending to 1.19% of its GDP (of which 14.4% was earmarked for investments),<sup>1</sup> the country is still among the worst performers in reaching the agreed goal of spending 2% of GDP on defense with 20% of that number being investments. This, unfortunately, also concerns defense research and development spending, for which 2% of the military budget should be used. In reality, it is about one quarter of that amount in

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1) *NATO Secretary General 2019 Annual Report* [online]. 19. 3. 2020 [retrieved on: 2020-08-06]. Available at: [https://www.nato.int/cps/en/natohq/opinions\\_174406.htm](https://www.nato.int/cps/en/natohq/opinions_174406.htm).

the Czech Republic. The coming years are not likely to bring about a positive change. There is one exception however, the country's promising space research projects.

On 1 January 2020, the Czech Republic opened its Satellite Center and space technologies became a priority for defense research. The Czech Republic also decided to significantly increase its contribution to the European Space Agency (ESA) budget. Over the last decade, moreover, an increasing number of Czech institutions and companies have been participating in civilian space projects involving development and manufacture of cutting-edge technologies with high added value.

## Space Competition

In the twentieth century, space was used by the competing superpowers mostly for military purposes. In the twenty-first century, however, space technologies are an essential piece of infrastructure allowing modern societies to benefit from services such as satellite navigation, communications and weather forecasts. Space technologies drive progress in areas such as robotics, mechanical engineering, electronics, sensors, optics, material science, biomedical engineering, automation and autonomous systems. Space-based technologies affect practically all aspects of people's lives, from their cell phones, the Internet, air travel and banking systems to the environment and agriculture.

Industries participating in space activities also tend to expand into other areas of the economy, which positively impacts the transfer of knowledge and space technologies for future use and commercial applications. Within a couple of years, the advanced technologies have trickled into the aircraft and automotive industries. Companies utilizing experience from space research often have a significant competitive edge. Satellite systems enabling communication, navigation, surveillance, observation, intelligence gathering, as well as targeting and guidance of precision weapons are also ever more important for the armed forces.

It is estimated that 88 nations and government consortia conduct some level of activity in space.<sup>2</sup> The number of commercial satellite operators is also rapidly increasing. The first artificial satellite of the Earth was launched by the Soviet Union in 1957. Currently, there are approximately 2,200–2,600 satellites in orbit and this number is set to increase five-fold in this decade. Just by 2025, 1,100 satellites will be launched into space each year. In comparison, the number was 365 in 2018. SpaceX's *Starlink* satellite Internet constellation alone will require twelve thousand satellites in orbit by 2027. While this is by far the largest such initiative, it is not the only one. Governments are not lagging too much behind private

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2) ROBINSON, Jana. Space Security Policies and Strategies of States: an Introduction. In: SCHROGL, K.-U. *Handbook of Space Security*. Springer Publishing International, 2020, p. 2.

companies: 1,150 government-owned civilian and military satellites are set to be launched over the next 10 years.<sup>3</sup>

## NATO

In December last year, the North Atlantic Treaty Organization (NATO) declared space as one of its operational domains alongside air, land, sea and cyberspace. Space is the key to the twenty-first century battlefields in terms of all levels of command and control. Practically no contemporary combat operation, conducted by the military of a developed nation, is possible without some reliance on space technologies. For this reason, the United States has also created a new branch of its military, the *United States Space Force* (USSF), and other countries will likely follow suit.

As concerns the use of space technologies, a modern military relies on three main components: global satellite navigation systems, telecommunications and remote surveillance of the Earth. Space is also emerging as a brand-new battlefield. The orbital space around the Earth may specifically experience aggressive actions against the aforementioned navigation, telecommunication and observation systems. Satellites can be either directly armed, cyber-attacked, temporarily or permanently put out of operations, or even attacked from the ground by anti-satellite weapons. These actions can result in disruption of intelligence gathering, satellite navigation and operation of early warning systems. NATO's chief interest in this area is to secure reliable and permanent access to space technologies, which is why it earmarked over EUR 1 billion for satellite communications for the period from 2020 to 2034 to ensure fast and secure information transmission.

## Budgets

All major powers interested in maintaining their military capabilities and technological edge are investing in space programs. Global government expenditure for space programs reached USD 70.9 billion in 2018. In 2024, this number should increase to USD 84.6 billion. The United States remains the largest spender, followed by China, Russia, France and Japan. The US space budget in 2018 was USD 40.9 billion, which is 58 percent of the total global space program expenditure. (The US share, however, historically reached up to 75 percent.) In the same year, China invested USD 5.83 billion and the Russian budget dropped from a record-breaking USD 9.75 in 2013 to USD 4.17 billion.<sup>4</sup> France's space expenditure

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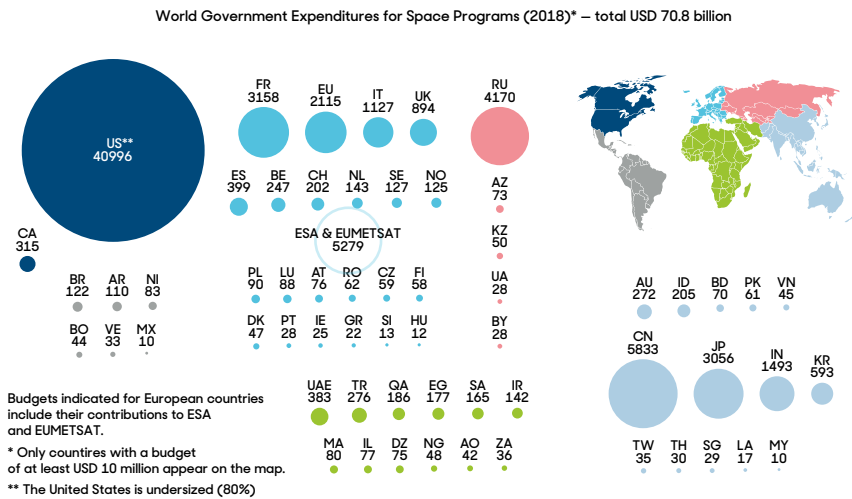
3) Euroconsult Government Space Programs Report. *SpaceRef* [online]. 25. 6. 2019. [retrieved on: 2020-08-06]. Available at: <http://spaceref.com/news/viewpr.html?pid=54448>.

4) Euroconsult. Profiles of Government Space Programs. 2019. In: SEMINARI, Simon. Global government space budgets continues multilayer rebound. *SpaceNews* [online]. 24. 11. 2019. [retrieved on: 2020-08-06]. Available at: <https://spacenews.com/op-ed-global-government-space-budgets-continues-multiyear-rebound/>.

of USD 3.15 billion<sup>5</sup> was the largest in Europe (except for Russia) and was higher than that of Japan at USD 3.1 billion. The next largest spenders were Germany, the European Union, India, Italy and the United Kingdom. Out of smaller countries, Israel had one of the most developed space programs as well as considerable capabilities in this area.

**Chart 1: World Government Expenditures for Space Programs in 2018 (in USD million)**

Source: Euroconsult.

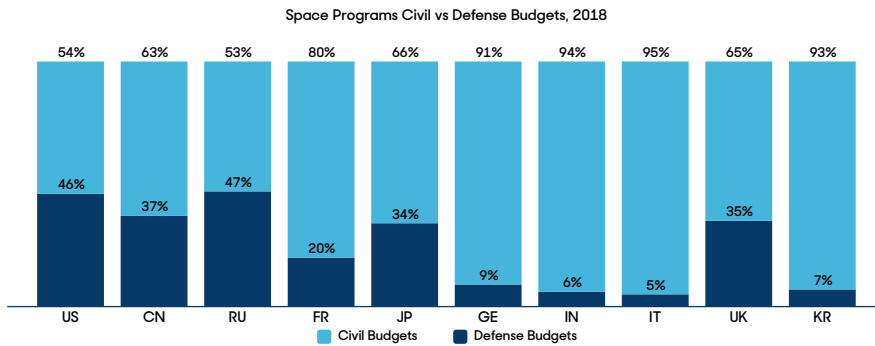


It is also interesting to see how much governments spend on civilian and military space programs. In 2018, USD 44.5 billion (63%) was spent on civilian space programs out of the total of USD 70.9 billion while USD 26.4 billion (37%) was spent on military programs. This was an 8.3% increase in the military space budgets compared to 2017. The military share in national space program budgets is the highest in Russia (47%) followed by the USA (46%), China (37%), UK (35%), Japan (34%) and France (20%). Countries thus still slightly favor civilian programs, with the caveat that individual institutions, research centers and companies often participate in both civilian and military programs, which often overlap and complement each other.

5) The amount includes both national space expenditures as well as France's contributions to the European Space Agency (ESA) and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT).

**Chart 2: Share of civilian vs. military space programs in national budgets in 2018**

Source: Euroconsult.



## The Czech Republic

Czech (previously Czechoslovak) space research has a long history spanning multiple sectors such as cutting-edge optics, mechanical engineering and aerospace. The development of the Czech space industry has recently been stimulated by two key events: the country became a member of the European Space Agency (ESA) in 2008 and the European GNSS Agency (GSA) decided to move to Prague in 2010. New incentives are certainly also being created by NATO in terms of new projects with the participation of the Czech armed forces. Still more opportunities will be presented when in 2021, the GSA will be transformed into the European Union Agency for the Space Programme (EUSPA) and Prague will serve as the HQ for all EU space programs,<sup>6</sup> making the Czech Republic one of the key “space centers” of Europe.

Thanks to the ESA membership and the GSA move to the Czech Republic, the country has become attractive for important players on the space research market. Many Western companies have opened subsidiaries in the Czech Republic and started building partnerships with the local players. One of the key factors behind this trend is the principle of geographic return ensuring that the vast majority of funds paid as a contribution to the ESA budget will find their way back to the national economy. Indeed, in practical terms, it remains impossible to join the supply chains of the large aerospace contractors such as Airbus, Thales and OHB without also participating in ESA projects.

The rate of return on public investment into space programs is usually higher than in other types of programs and this positive contribution has been demonstrated by a number

<sup>6</sup> The staff working in Prague will also be increased from 200 to 700 as part of the GSA's transformation into EUSPA.



of different studies. One euro invested in ESA space activities thus yielded, in strictly economic terms, 4.8 euros in Norway (in the period from 1985 to 2012), 4.5 euros in Denmark (2000–2007), 2.2 euros in Portugal (2000–2009) and 2.07 euros in Canada (2000–2009). A similar economic effect was also noted in OECD reports released from 2007 to 2011.<sup>7</sup> Reaching the rate of return seen in Nordic countries would be excellent, but the Czech Republic definitely does have the potential to even achieve levels of return similar to Canada and Portugal, if that is not already the case and these numbers already mean that the money is well spent.

From 2008 to 2020, Czech companies and universities carried out nearly 400 projects.<sup>8</sup> In 2018 alone, over 60 Czech companies participated in ESA projects and dozens of other businesses took part as subcontractors. There is a great deal of room for growth in this decade as the competitiveness and capacities of Czech companies and institutions continue to improve. The Czech government has also recently approved the National Space Plan for 2020–2025, which also includes an increase in annual funding for ESA activities to CZK 1,530 billion.<sup>9</sup>

## A Czech Footprint in Space

The European Union recently created the *Directorate-General Defence Industry and Space*. While the planned space budget was slashed as a result of the Covid-19 pandemic, the EU plans to invest EUR 13.2 billion in the next seven years<sup>10</sup> to reflect the increasing scientific and geopolitical importance of space. Moreover, Czech companies and institutions can greatly profit from the allocated funding to increase domestic research and manufacturing capacities. There is no doubt that the participation of the Czech private and public sectors in space projects is a welcome contribution towards the Czech industry and economy, whose importance can increase even further in the future. The growth in the Czech space industry also helps to dispel the rather unflattering reputation of the Czech Republic as the “assembly plant” of Europe.

The size of the Czech space industry will, for obvious reasons, never be comparable with the leading powers. Given its size, however, the Czech Republic’s know-how and its

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7) National Space Plan 2020–2025, p. 7.

8) NESLÁDEK, Václav. Na investice do budoucnosti ČR v kosmickém průmyslu půjde o bezmála 300 milionů Kč více než letos. *Czech Space Portal*[online]. 2. 12. 2019 [retrieved on: 2020-08-11]. Available at: <https://www.czechspaceportal.cz/na-investice-do-budoucnosti-cr-v-kosmickem-prumyslu-pujde-o-bezmala-300-milionu-kc-vice-nez-letos/>.

9) CZK 1.205 billion from the budget of the Ministry of Transport and CZK 0.325 billion from the Ministry of Education.

10) Prior to the crisis caused by the Covid-19 pandemic, the plan was to allocate EUR 16 billion to the space program, a 50% increase over the 2014–2020 long-term budget. In: HENRY, Caleb. European Commission agrees to reduced space budget. *SpaceNews*[online]. 21. 7. 2020 [retrieved on: 2020-08-11]. Available at: <https://spacenews.com/european-commission-agrees-to-reduced-space-budget/>.

capacities in businesses and research institutes are definitely noteworthy and have an upward trend. The Czech Republic is also becoming an increasingly successful participant in NATO and EU space programs. For illustration purposes, ESA is currently using two launch vehicles developed in Europe, *Ariane 5* and *Vega*. The payload fairing is an important part of *Ariane 5*, and Aerotech Czech, a company based in Klatovy, supplies its important components. The same company is also participating in the manufacture of components for the new *Ariane 6* launch vehicle, the future flagship rocket of the European space program. Additional Czech businesses, MCE Slaný and UNEX (Uničov) are respectively involved in the construction of the new launch complex and of the undercarriages for the launch base. Brno-based SAB Aerospace is developing a new type of payload adapter for the *Vega* launch vehicle.

In 2017, the Czech Republic launched a nanosatellite developed and built by a consortium of nine companies and university research centers under the auspices of the Czech Aerospace Research Centre (VZLÚ). VZLÚ is currently preparing a new satellite to be launched into space by SpaceX's *Falcon 9* rocket in late 2020. Research teams from eleven institutes of the Czech Academy of Sciences are coordinated under the *Space for the Mankind* program also associating six university centers and nearly twenty industrial partners. Thanks to ESA membership, Czech businesses and institutions could participate in the agency's flagship project, the *Solar Orbiter* probe launched on 10 February 2020. The exceptional mission carries ten instruments, four of which were developed with some form of Czech participation. By the end of 2020, *Solar Orbiter* will be followed into space by the *Taranis* mission led by the French space agency (CNES), which Czech researchers have also worked on. Other important feats of Czech science include instruments developed as part of the international consortia for ESA's Jupiter Icy Moons Orbiter (*JUICE*) and the *ExoMars* rover bound for the Red Planet's surface. Both missions are set to be launched within two years. Future European missions such as *ATHENA* will provide still more opportunities for academic centers to participate.

The concentration of space research know-how in the Czech Republic is considerable, which is demonstrated by deliveries of Czech-made measuring instruments, as well as articles published in prestigious peer-reviewed journals and membership in a number of international research consortia. Opportunities thus abound to further interconnect university research centers and boost their role as initiators of contracts with industrial partners. This area provides significant opportunities for the growth of the economy and knowledge and for creating added value, promoting a shift from the role of a subcontractor to that of a technology leader.

## SATCEN CR

The Ministry of Defence of the Czech Republic also follows current trends. Its own satellite center (SATCEN CR) reached operating capability in early 2020 and has become a unique expert center in NATO, joining other relevant players in the space exploration arena. The center's mission is to provide specific, detailed and accurate information on the observed targets. Its main benefit consists in the ability to obtain, utilize and analyze high-resolution electro-optical (multispectral) and radar imaging from space in near real time. Aside from its defense tasks, the center as a national institution is also able to obtain imaging for civilian use, thus benefiting the Czech public administration.

SATCEN CR also has potential significant overlaps with research and development in both the private and public sectors, since Earth observation is a rapidly developing industrial and scientific discipline. The center thus follows the latest trends and tries to flexibly adapt to changing demands and developing technology as concerns obtaining and analyzing data, as well as presenting information. Its ambitious objective is to maintain its place among the global elite and push the limits of technology still further, in cooperation with technology companies.

Data collection has expanded to encompass far more than just traditional electro-optical sensors, i.e. photographic imaging. The center is able to obtain rapid series of images or use other parts of the electromagnetic spectrum such as near infrared, thermal and *RADAR/LIDAR* imaging. Its analytical division focuses on securing top technological equipment and the expertise of its specialist staff. Excellent software tools and AI systems can only run on a robust hardware infrastructure. These systems are used by experts with extensive knowledge and skills in the individual areas of image interpretation and analysis. 3D models and the possibility to see the surveilled area in virtual or augmented reality provide radically different means of absorbing information and have an influence on the planning process, a key part of command and control. Cooperation with external technology contractors is essential. Last but not least, the center's staff have excellent job prospects, in terms of monetary compensation, if and when they should decide to move on.

Three defense research and development projects are currently in development for the center. A modular expert system using machine learning is being developed in the area of AI to automatically detect, extract and identify targets in satellite images. Another project is oriented on data independence and involves a stratospheric imaging system designed for continuous surveillance of a particular surface area of the Earth. The Czech Republic has also been working on its own satellite system for civilian and military Earth observation: the *GOLEM X* project is designed to conduct experiments in orbit and help identify technologies necessary for introducing a national satellite observation system. This should

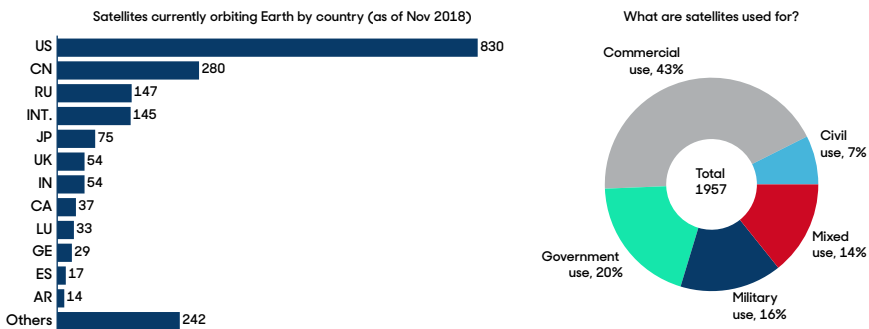
be followed by a larger *GOLEM* constellation consisting of several satellites designed to fulfill various roles in space operations. All these projects count with the participation of Czech teams, research centers and companies.

A satellite system can be perceived as a strategic investment into the future. For the academic sphere, it means not only developing the product and testing the associated technologies in orbit, but also involving many fields connected with the use of Earth observation data. From a military and safety perspective, the satellite observation system will significantly improve planning, command and support in domestic and international exercises, as well as in overseas military deployments and intelligence. The information obtained will also be useful in border security operations, transport, construction, diplomacy and international trade.

A systematic investment in a national satellite system will doubtlessly improve surveillance capabilities, which represent one of the Czech Republic’s key commitments to NATO. In this capacity, it will also help the country meet the obligation to spend 2% of its GDP on defense and increase military research and development spending to the required 2% of the overall military budget. Developing the entire system is clearly complementary to other Czech activities within ESA and can lead to even deeper participation of Czech businesses and institutions in the far larger American public and private research programs.

### Chart 3: Countries with the most satellites in space

Source: World Economic Forum



## Conclusion

Public and private space programs best demonstrate the importance of a comprehensive understanding of defense, economy and science. Even more so than at present, space research and exploration will certainly be crucial for ensuring national security and competitiveness in the near future.

Civilian and military space programs will receive increasingly more attention and funding. Developing adequate capacities by the Czech government and public support for the systematic involvement of domestic companies and research centers in international projects open up vast opportunities. The membership of the Czech Republic in ESA and NATO, as well as the HQ of the European Union Agency for the Space Programme (EUSPA) located in Prague, give the country a certain competitive advantage.

The Czech Republic's space program will obviously never be comparable to that of leading space powers, but the growing number of Czech companies and institutions in various space consortia and projects offers hope that the country could play a role in the new space race. This will require, however, long-term commitment and consistent cooperation between government institutions, universities, other R&D centers and private companies. If it succeeds, the Czech Republic will shift from being a country of cheap labor towards becoming a hi-tech developed nation.

## Recommendations:

- 1. Actively participate in EU and NATO space programs, including national programs of key member states.**
- 2. Develop the Czech armed forces' space capabilities.**
- 3. Reach the required 2% of research and development spending in the budget of the Ministry of Defense and maintain space projects among the departmental priorities.**
- 4. Achieve optimum levels of cooperation between military and civilian activities; offer maximum support for collaboration among public, private and R&D institutions.**
- 5. Take steps to create a Czech National Space Agency.**

# Background to Failures in Education: Social Problems and Funding

Jiří Můnich, Daniel Prokop, Václav Korbel, Štěpán Kment, PAQ\_Research

The Czech Republic is marked by extremely high education inequalities and the strong influence of the students' family background on their access to quality education. The Czech Republic reports worse results than most EU countries with a similar recent history, such as Poland and Estonia. The Program for International Student Assessment (PISA) surveys indicate that the children in these countries who come from worse social backgrounds tend to achieve better results. At the same time, the overall results of these countries have been improving over time. In this study, we investigate a surprisingly neglected topic – to what extent does local funding for elementary and pre-school education reflect the scope of social and educational problems in the given locality. We found this not to have been the case.

## Introduction

State funding of teachers' salaries (more or less standardized across the country) rarely reflects the socio-economic differences among municipalities. The extreme decentralization of the Czech education system also provides municipalities with a high degree of autonomy in deciding on the amount of funding allocated to investments and the operations of the schools they run. The amount of municipal co-funding of school investment and operational costs does not significantly reflect the students' social and educational problems. Additionally, the Czech Republic has many small municipalities, which translates into a higher share of small schools with highly varying educational conditions.

## Main Findings:

- Our unique empirical analysis conducted at the level of “municipalities with extended competence” (*obce s rozšířenou působností*, ORP) has confirmed that social and educational problems are closely interlinked in the Czech Republic. The distribution of educational problems is closely associated with the degree of destabilizing poverty in particular regions, which manifests as the number of families subject to debt collection procedures and unstable housing arrangements outside of standard residential premises (i.e., not in rented or owned houses and apartments). Social disadvantages such as low level of education on the part of parents, unemployment, and a high divorce rate are less strongly linked to educational problems. The funding of schools and supporting staff from municipal budgets is not primarily set up to combat social and educational problems in municipalities. This is a comprehensive ecosystem of funding coming from various sources which cannot be described in simple relational terms; funding can sometimes contribute to mitigating the problems, while in other cases, it cannot.
  1. We have not identified any strong link between the amount of school funding provided by municipalities and the educational problems in those municipalities. This confirms the hypothesis that the methodology of school funding does not reflect the social disadvantages and needs of the students.
  2. The amount of funding allocated for the salaries of pedagogical workers in municipalities with higher unemployment and lower educational achievement is only marginally higher. This is, however, likely caused by the fact that such municipalities have smaller schools, have higher fixed costs and also more teachers per student.
  3. The amount of the state contribution towards the salaries of pedagogical workers in schools is not linked to the local rates of destabilizing poverty (the number of people subject to debt collection, housing distress, etc.). This is the case despite the fact that destabilizing poverty significantly impacts children and is regionally strongly linked to educational failure.
  4. School investment spending is somewhat lower in areas with higher social disadvantages. Poorer and smaller municipalities report lower investments in school repairs, construction, equipment, etc.
- We also analyzed how the prevalence of destabilizing poverty (debt collection, housing distress) and educational problems relate to school funding. The relationship is fairly weak. Non-investment municipal spending for schools is only linked with lower educational failure rates in richer ORPs. In poorer ORPs, in contrast, the funding is mostly used for operational expenses (heating, etc.). The degree of educational failure

is slightly lower in poorer ORPs with a greater state contribution towards the salaries of pedagogical and non-pedagogical staff. The effect, however, is extremely limited. The central government does not help much in these areas, and where it does, the money is not always allocated efficiently.

- A qualitative case study of two ORPs – Krnov and Ostrava – has demonstrated that an efficient allocation of funds within an ORP can, if combined with other more subtle steps (coordination and communication among local bodies), improve the access of all students to quality education and reduce educational inequalities. This analysis also indicated that municipalities can seek out various resources to fund these steps. This reinforces our conviction that any analysis of the relationship between funding and educational inequalities must include all kinds of financial flows into the area under scrutiny.
- The Covid-19 pandemic also tends to accentuate inequalities in access to quality education. Students from socially disadvantaged families receive lower support from their parents and have worse access to information and communication technologies (ICT). The economic downturn caused by the pandemic has also negatively impacted municipal budgets. Uncertainty about budgets and the forced need to prioritize may result in a decrease in municipal operational and investment spending in the area of education. Due to the frequent concurrence of educational and social problems, municipalities with more acute social problems may choose to focus on dealing with those first, thus further aggravating educational inequalities.
- A key to dealing with educational inequalities consists not merely in the amount of funding but also in using the available funds efficiently. A more thorough analysis is thus needed to better understand the relationship between funding and inequalities. If educational spending becomes more predictable, it will be possible to allocate it more efficiently, e.g. on the basis of school rankings and indexation. Additional successful measures to reduce educational inequalities, that have been tried and tested abroad, include investments in preschool education, dealing with educational and social problems concurrently on the basis of interdepartmental cooperation (in the Czech Republic, this would primarily involve the Ministry of Education, Youth and Sports, the Ministry of Labor and Social Affairs and the Ministry of Health), supporting local bodies and promoting innovative solutions (such as Local Action Plans). On the school level, it is important to promote inclusive education, which will enable further training of pedagogical workers to improve, for example, their skills in dealing with diverse student groups, as well as ensuring the availability of assistant staff. This includes funding for social pedagogues, teaching assistants, and school psychologists who



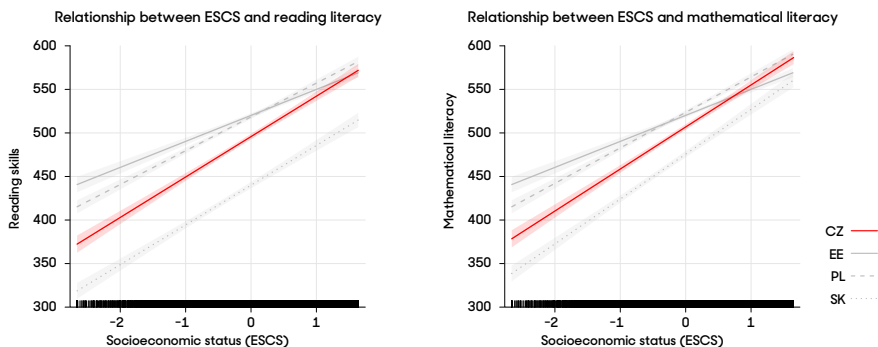
can better work with the students, their families and whole communities. Financial predictability is essential for this to be possible.

## Inequalities in Education in the Czech Republic Compared to Other Post-Communist Countries

Growing inequalities are one of the most conspicuous characteristics of the Czech education system in the post-Communist era and are apparent across various regions and social groups. There is a significant mismatch, for example, between the impact of certain social phenomena such as debt collection procedures, poverty and crime on various social groups. The widening gap in access to quality education and educational attainment has been documented for at least two decades.<sup>1</sup> International comparisons demonstrate that this problem is more serious in the Czech Republic compared to similar countries. Over the last ten years, the Czech Republic has always scored in the upper third of countries where educational outcomes most strongly correlate with socioeconomic status.<sup>2</sup>

### Chart 1: Relationship between the economic, social and cultural status (ESCS) of parents and reading and mathematical literacy

Source: PISA 2018, 9th grade students. Linear regression model without control variables. The chart indicates the average marginal effects (AME) – that is, how the estimated PISA score in reading/mathematical literacy of an average student changes in relation to the economic, social and cultural status of their parents.



As Chart 1 shows, the relationship between the socioeconomic status (ESCS) of parents and the students' outcomes is stronger in the Czech Republic compared to similar countries.

- 1) BASL, Josef, MATĚJŮ, Petr and Jana STRAKOVÁ, ed. *(Ne)rovné šance na vzdělání: vzdělanostní nerovnosti v České republice ((Un)equal opportunities in education: educational inequalities in the Czech Republic)*. Prague: Academia, 2006.
- 2) PEÑA-LÓPEZ, I. *PISA 2015 Results (Volume I). Excellence and Equity in Education*. Paris: OECD Publishing, 2016. SCHLEICHER, A. *PISA 2018: Insights and Interpretations*. Paris: OECD Publishing, 2019.

The incline is steeper for the Czech Republic than for Estonia and Poland and is comparable to Slovakia, where the gradient is one of the highest in the EU. Estonia is among the countries with the lowest inequality and is also one of the countries with high average student results. Between 2000 and 2018, Poland managed to significantly improve its results while maintaining the same or even decreasing educational inequality.<sup>3</sup>

Our study also addresses the question of whether public policies, especially as regards allocation of funding to elementary schools, contribute to increasing educational inequalities in the Czech Republic. Demonstrating that changes in educational inequalities are caused by (un)suitable educational policies, or rather the funding system, is methodologically difficult even in an international context. There are studies<sup>4</sup> suggesting that in Poland, for instance, the 1999 reform of secondary schools, that reduced the number of education paths from three to one (thus practically boosting equal access to quality education for students from various backgrounds), had an extremely strong effect. Additionally, international research indicates that the degree of financial support for schools can influence the students' results<sup>5</sup> and may decrease educational inequalities among communities.<sup>6</sup> In the Czech Republic, there is a lack of systematic records of this nature, as data collection serves mostly for the purposes of financial accounting. This topic has been neglected not only by the Ministry of Education, but surprisingly also by the academic research community.

## A Map of and the Relationship between Social and Educational Problems

Certain administrative regions (Karlovy Vary and Ústí regions in PISA surveys) often score far worse in international functional literacy tests than the socioeconomic status of local families would suggest. Conversely, other regions (e.g. Liberec, Zlín) score better. This indicates that the parents' socioeconomic background is not necessarily the only factor behind educational failure.

On regional and municipal levels (in our study, municipal level means the administrative districts of municipalities with extended competence – ORPs) in the Czech Republic, we still know relatively little about the relationships between social and educational

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3) SCHLEICHER, A. *PISA 2018: Insights and Interpretations*. Paris: OECD Publishing, 2019.

4) MAHFOOZ, Sara Bin and Kate HOVDE. *Successful education reform: lessons from Poland (English)*. Europe and Central Asia knowledge brief; volume no. 34 [online] Washington, D.C.: World Bank Group, 1.11.2010, 2. 6. 2011 [retrieved on: 2020-09-11]. Available at: <http://documents.worldbank.org/curated/en/711041468093564484/Successful-education-reform-lessons-from-Poland>.

5) JACKSON, C. K. Does school spending matter? The new literature on an old question. In: L., Tach, Miller D. L. and R. Dunifon. *APA Bronfenbrenner series on the ecology of human development. Confronting inequality: How policies and practices shape children's opportunities*. American Psychological Association, 2020, pp. 165-186.

HÆGELAND, Torbjørn, Oddbjørn RAAUM and Kjell G. SALVANES. Pennies from heaven? Using exogenous tax variation to identify effects of school resources on pupil achievement. *Economics of Education Review*. 2012, 31(5), pp. 601-614.

6) LAFORTUNE, Julien and David SCHÖNHOLZER. *Measuring the Efficacy and Efficiency of School Facility Expenditures* [online]. 3. 12. 2019 [retrieved on: 2020-09-09]. Available at: <http://www.cirje.e.u-tokyo.ac.jp/research/workshops/emf/paper2019/emp1223.pdf>.

problems. We do not know the role played by regional and municipal funding. These questions are therefore analyzed in the following parts of this study.

The following can be considered indicators of educational problems:

- Percentage of unsuccessful students – a three-year average of students who fail to successfully complete the school year (receiving “F” on their school report) as a fraction of all elementary school students in an ORP.
- Number of classes missed – three-year average per student in an ORP.
- Percentage of students failing to complete the 9th grade – a percentage share of students in the school year 2018/19.

The following can be viewed as social problems:

- Percentage of children in housing distress – the share of children without a home, living in public housing facilities (hostels and other lodgings for the poor; *ubytovna* in Czech), institutional care facilities, unsuitable apartments or in uncertain temporary accommodations (with their relatives/friends) in an ORP in 2018.
- Percentage of parents subject to a debt collection procedure – an estimated percentage of people with children in households affected by court-ordered debt collection procedures in an ORP based on the *Debt Collection Map* by the Czech Statistical Office (CSO).
- Divorce rate – the average number of divorced marriages in an ORP per 1,000 inhabitants in the 2014–2018 period.
- Unemployment rate – percentage of the unemployed in the total population of an ORP aged 15 to 65 in the year 2014 (this better corresponds to regional long-term unemployment than the data from 2018).
- Low educational attainment – percentage of people with only compulsory school education in the population of an ORP.

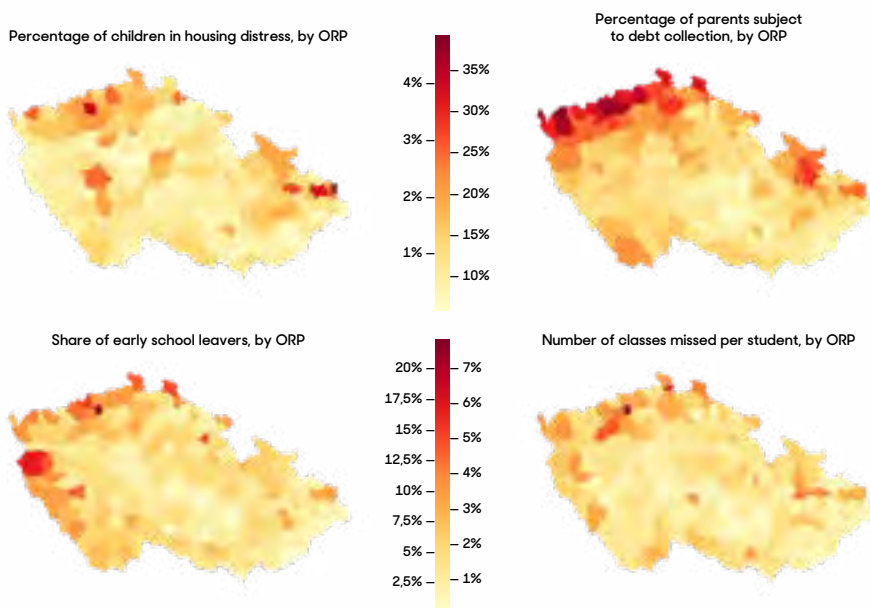
### **The Relationship between Social and Educational Problems on the ORP Level**

Our analysis indicates that various types of educational problems are most closely linked to the percentage of parents subject to a debt collection procedure and the percentage of children in housing distress. The correlation with the unemployment rate is weaker, while the link to the divorce rate is the weakest. The maps in Chart 2 indicate that social problems (debt collection and housing distress), as well as educational problems (failure to complete the 9th grade of school, missed classes), are stronger in structurally depressed regions,

especially in the Ústí and Karlovy Vary regions. The situation would be the same with regard to other types of educational problems.<sup>7</sup>

## Chart 2: Maps of educational and social problems in ORPs

Source: Czech School Inspectorate, Czech Statistical Office, Agency for Social Inclusion, Social Housing Platform, authors' calculations



This indicates that certain types of social problems are associated with educational problems more than others. Using a factor analysis, we identified two main types of disadvantages, which we call “destabilizing poverty” and “socioeconomic disadvantage”. Destabilizing poverty is chiefly linked to a higher rate of debt collection procedures in the parent population and unsuitable housing arrangements for the children. A socioeconomic disadvantage is linked to the population’s educational attainment, and long-term increased unemployment in an ORP. All the individual types of educational problems form together a single factor – the educational failure rate in the given locality.

Destabilizing poverty is linked to educational problems in ORPs three times more than socioeconomic disadvantages. Therefore, within regions and adjusted for the

7) For more details, see KORBEL, Václav, Michal KUNC, Daniel PROKOP and Tomáš DVOŘÁK. *Souvislost sociálního znevýhodnění a vzdělávacích problémů (Relationship between social disadvantages and educational problems)*. PAQ Research, 2020.

unemployment rate and educational attainment in the locality (the socioeconomic disadvantage factor in an ORP), municipalities with higher parent debt collection rates and children in housing distress have much higher rates of educational problems. This is not necessarily a causal relationship, but it demonstrates that – on a regional level – educational problems are closely linked to the destabilizing effects of social exclusion of families with children – not just the educational attainment and employment rate of parents within the given locality.

**Destabilizing poverty is linked to educational problems in ORPs three times more than socioeconomic disadvantages.**

### **The Relationship between Municipal Spending and Social Problems**

To analyze the correlation between the amount of funding, school staffing and social problems in ORPs, we also supplemented the previous findings with an analysis of operational and investment funding of schools.<sup>8</sup> Data on funding of elementary schools and kindergartens<sup>9</sup> show three dominant groups:

- **Pedagogue salaries (non-investment transfers):** The amounts of these transfers are not determined by municipalities or ORPs – these are resources from the state’s budget distributed and forwarded by regional administrations.<sup>10</sup> The salaries of individual members of pedagogical staff are chiefly determined by valid pay scales and regulations; school management can influence them only marginally. Municipalities or regions may send contributions towards the salaries/remunerations of pedagogical staff, but in reality, these items are negligible.
- **Investment spending:** Expenses related to construction and one-off renovations of school facilities. This item in municipal budgets is often acquired through municipalities’ own initiative in the form of ad hoc subsidies for a particular project.
- **Operational spending (non-investment spending):** Funds in municipal budgets allocated for ordinary school operations. This includes standard maintenance of buildings, utilities and salaries of non-pedagogical staff such as repairmen, accountants and cooks; these funds can also be used to pay part of teaching assistants’ salaries.

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8) Municipalities with extended competence are administrative units comprising several smaller municipalities. There are 205 ORPs in the Czech Republic, which are further divided into a total of 6,253 municipalities. ORPs are not, in themselves, required to fund schools in subordinated municipalities. As this analysis maps regional differences (and some variables are only available on the ORP level), spending calculated as an “average” for the entire ORP also remains an issue.

9) Data on municipal finances (sheet Fin 2-12) with all records concerning preschool and elementary education. These are paragraphs starting with 311\*, see <https://monitor.statnipokladna.cz/datovy-katalog/ciselniky/prohlizec/22>.

10) The system of funding of regional schools has changed since 2019 (see <https://www.msmt.cz/vzdelavani/skolstvi-v-cr/ekonomika-skolstvi/reforma-financovani-regionalniho-skolstvi>).

Data on non-investment spending and transfers from 2014–2017 were used. Investment spending was aggregated for the entire period since, due to its nonrecurring nature, it fluctuates wildly in municipalities from year to year.

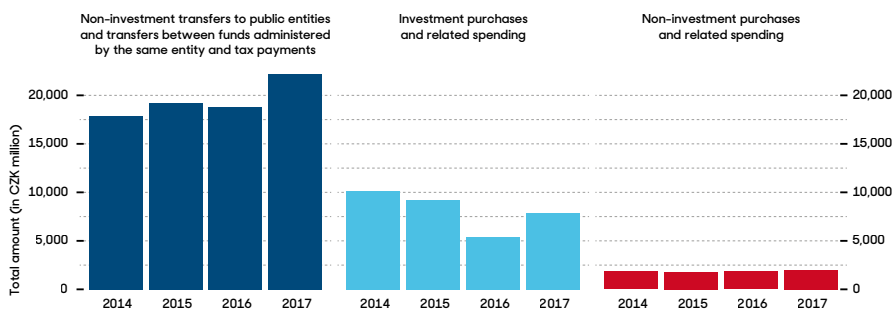
Chart 3 indicates that non-investment transfers (i.e., the salaries of pedagogical staff) are by far the largest item. This item has also seen the most dynamic growth. As noted earlier, however, municipalities cannot really influence its amount.

Investment spending is the second largest item. It varies greatly over time but does not reveal any significant trends.

Of the three main items, non-investment spending is the lowest. The increase in non-investment transfers (state money for the salaries of pedagogical staff) can be an important factor behind the stagnation in non-investment spending, as the municipalities do not have to co-fund the pedagogical staff from their own budgets so often.

### Chart 3: National spending according to item type

Source: Ministry of Education, Youth and Sports, authors' calculations



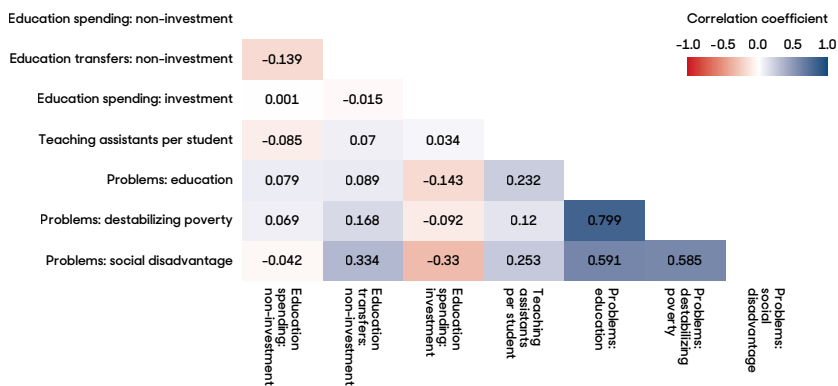
Apart from financial data, we use data on the jobs of supporting pedagogical staff – teaching assistants in elementary schools, and kindergartens, other educators and school psychologists. Since teaching assistants completely dominate the records (96%), we refer to the whole group as “teaching assistants” for the sake of brevity. We re-calculated the data to a full-time jobs equivalent.<sup>11</sup>

11) The data were taken from the *Principal's Report R13-01* form filled in by a school's principal. Data from Principals' reports submitted by all schools run by a municipality were used. Simultaneously, the data on funding and the numbers of supporting staff were recalculated on a per child (under 15 years) per year basis for each ORP to facilitate a comparison between variously sized ORPs. This is the number of children who currently and potentially require pre-school and elementary education services. In order to permit the application of linear models, all variables were adjusted through nonparanormal transformation, which maintains the order of the variables but adjusts them to normal distribution. In the following analysis, the logarithms of the population were used as weights in order to account for ORP size but simultaneously reduce the influence of extremely large ORPs such as large cities. The analysis also excludes Prague as a special kind of ORP, and Bučovice, due to the presence of certain extreme funding values.

We will firstly analyze the correlation between funding and staffing of schools and composite factors of social and educational problems. These are described in the previous parts and include three factors: educational problems, destabilizing poverty and social disadvantages. Chart 4 shows the relations among all variables (correlation). Correlation ranges from -1 to 1. The value of 1 indicates perfect positive dependence, -1 shows perfect negative dependence, and 0 indicates no correlation between the variables. To simplify, values higher than 0.3 or lower than 0.3 can be considered a significant correlation.

**Chart 4: Correlation matrix of funding, staffing and social and educational problems re-calculated on per student basis**

Source: Czech School Inspectorate, Czech Statistical Office, Ministry of Education, Youth and Sports, Agency for Social Inclusion, Social Housing Platform, authors' calculations



The relationships in Chart 4 indicate a strong linkage among all the types of social and educational problems, as was already demonstrated within the initial analysis in the previous chapter. It is also apparent that more significant social and educational problems in an ORP also lead to a higher number of teaching assistants per student. This makes sense as these schools provide supporting measures more often.<sup>12</sup>

Non-investment transfers from the state are higher in those ORPs which struggle with a general social disadvantage (municipalities with lower educational attainment and long-term increased unemployment). This can be a result, however, of the fact that municipalities with a general social disadvantage (higher unemployment, lower educational

12) ČADA, Karel and Daniel HŮLE. *Analýza segregace v základních školách z pohledu sociálního vyloučení (An analysis of segregation in elementary schools in terms of social exclusion)* [online]. Prague, 2019 [retrieved on: 2020-10-01]. Available at: [https://socialnipolitika.eu/wp-content/uploads/2019/11/Analýza\\_segregace\\_2019.pdf](https://socialnipolitika.eu/wp-content/uploads/2019/11/Analýza_segregace_2019.pdf).

attainment) are frequently small. Consequently, the schools there are also smaller and the ratio of pedagogues to students is higher.

A more important finding is that the non-investment transfers by which the state could reduce educational inequalities are not linked to the rate of destabilizing poverty. This is despite the fact that this type of poverty (manifested as high debt collection rates and children's housing distress) is most tightly linked to educational problems. The funds for pedagogical and supporting staff are thus not being used where they are most needed. The picture is the same with regard to municipal non-investment spending, which is not related to social disadvantages or destabilizing poverty. These are the funds that municipalities can use to combat inequality (tutoring, supportive funding of pedagogical staff, etc.).

Municipalities facing a general social disadvantage (lower educational attainment, long-term increased unemployment) show lower investment spending – they are investing less in repairs, equipment, etc. This can again be caused by the municipalities' smaller size, poverty and lesser readiness to invest, and the fact that in areas such as these, it may be difficult to save up enough money for investments in education.

The relationships between the individual types of spending and the types of problems are nevertheless complex and cannot be easily described by correlations among the variables. The other part of the relationships is, therefore, modeled using a network analysis.

Chart 5 shows partial correlations which, in simple terms, mean relationships adjusted to remove the influence of the other variables in the chart.<sup>13</sup> Socially disadvantaged ORPs demonstrate lower investment spending and higher non-investment transfers. In other words, if an ORP struggles with a greater social disadvantage (high long-term unemployment, a large share of people without secondary education), it spends less on investments in education. Conversely, these ORPs spend more money on the salaries of pedagogical and non-pedagogical staff (i.e., on non-investment transfers). The problem is that the amount of these non-investment transfers is not linked to the prevalence of destabilizing poverty (debt collection procedures, housing distress in the ORP), although it strongly determines the rates of educational failure in the locality. Educational problems, in contrast, are only weakly related to non-investment transfers. ORPs with higher numbers of missed classes or higher rates of failure to complete a school year do not receive more money on average for pedagogical and non-pedagogical staff.

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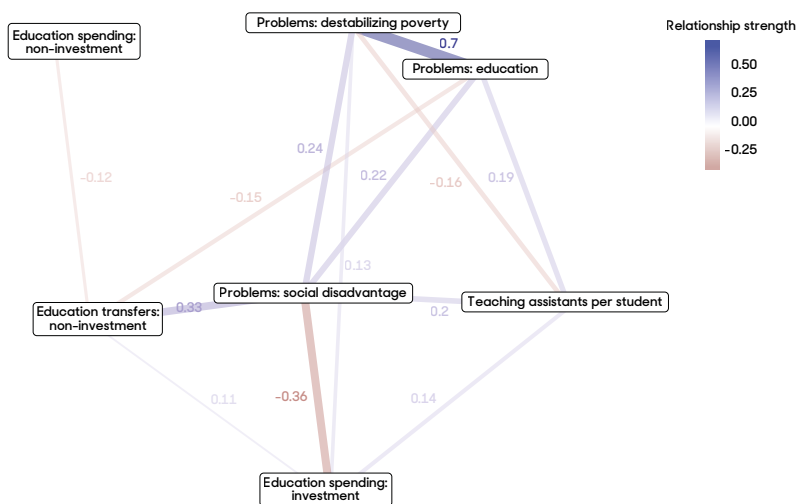
13) The correlation between poverty and educational problems means that an ORP with greater poverty also has more pronounced social problems and vice versa. Correlation does not, however, necessarily imply causation. If a higher prevalence of debt collection procedures in an ORP causes both poverty and educational problems, a correlation will be observed between the two variables, although in reality the relationship is caused by a third variable (the prevalence of debt collection). If all three variables are known, we are able to "subtract" the influence of debt collection from the relationship between poverty and educational problems. This will reveal the relationship between the two variables independently of the influence of the third variable.



Indices of social and educational problems, consisting of multiple variables, may potentially conceal relationships among the individual variables. If a network analysis for the individual variables is conducted, then the prevalence of debt collection is manifested as the central variable in relation to educational problems. In contrast, funding mostly lies on the periphery of the relationships. It is more frequently linked to the variables forming the social disadvantage factor, i.e. unemployment and the share of the ORP population with low educational attainment. The conclusion is thus the same as in the previous chapter, i.e. that school funding does not help mitigate educational inequalities, nor is it associated with the factors of destabilizing poverty, which plays a key role in the emergence of educational problems.

### Chart 5: The network of relationships among funding, social and educational indices

Source: Czech School Inspectorate, Czech Statistical Office, Ministry of Education, Youth and Sports, Agency for Social Inclusion, Social Housing Platform, authors' calculations



## Summary:

- Non-investment transfers that should be used by the state to, e.g., provide for the supporting professions and measures designed to help children from disadvantaged backgrounds, are slightly higher in socially disadvantaged areas. The relationship is weak, however, and probably caused by the fact that schools in these areas are smaller.
- Funding does not in all probability reflect the prevalence of the most serious problems that destabilize families and are closely linked with educational failure (debt collection, housing distress, etc.).
- ORPs struggling with a general social disadvantage – which are often smaller and poorer – are, moreover, affected by some of the lower investment types of spending on the part of municipalities.
- The funding problems are intertwined – the state sends slightly more money to smaller and poorer municipalities where the teacher-student ratio is higher. These municipalities lack, however, the resources for other kinds of spending. ORPs struggling with destabilizing poverty (debt collection and housing distress) do not benefit from the above-average rates of either type of funding.
- The relationship between financing and educational success is therefore extremely weak and unclear, perhaps due to this reason.

## The Impact of Funding in Relation to Destabilizing Poverty in ORPs

The lack of any linkage between the prevalence of educational problems and the funds allocated to education within ORPs is surprising. It should be understood, however, that the relationships among variables in networks only reflect total correlations among all ORPs. There is the possibility that these relationships differ according to the social situation in an ORP. The analysis has already indicated that the key social phenomenon associated with educational failure is the prevalence of destabilizing poverty (parents subject to debt collection and housing distress). More specifically, two questions can be raised:

1. Is the relationship between non-investment spending and educational problems different among ORPs with a different prevalence of destabilizing poverty? In other words, do municipalities with the same level of destabilizing poverty manifest lower educational failure rates if they spend more on their schools' operations?

2. Is the relationship between non-investment transfers and educational problems different among ORPs with a different prevalence of destabilizing poverty? In other words, do municipalities with the same level of destabilizing poverty manifest lower educational failure rates if they receive more money for pedagogical and supporting staff from the state?

To answer these questions, all ORPs were divided into four groups (quartiles) based on the prevalence of destabilizing poverty: the 1st quartile has the least problems while the 4th quartile has the most. Given the low number of observations and the spread of values, the observed relationships are merely tentative and require further analysis using more detailed data – ideally on the level of the six thousand individual municipalities in the Czech Republic.<sup>14</sup>

Chart 6 shows the average values of the index of educational problems for the four ORP groups divided based on the prevalence of destabilizing poverty and the amount of non-investment education spending by municipalities. Chart 7 demonstrates a similar combination but highlights the correlation with the amount of non-investment education transfers from the state. There is a clear relationship between educational problems and destabilizing poverty. Currently, none of the types of funding – either from the state or the municipalities – significantly disrupts this relationship:

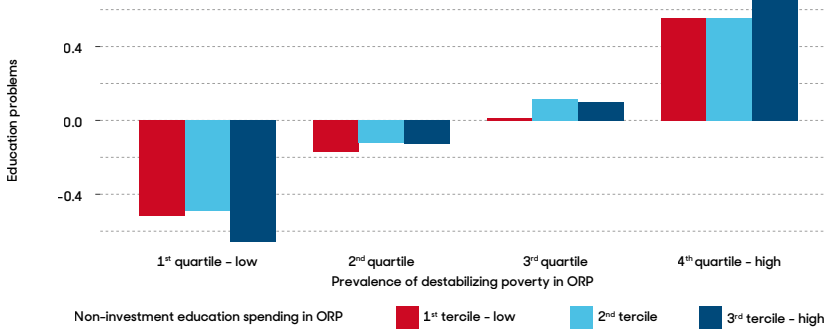
- In non-investment spending, the only influence is discernible in the quarter of municipalities with the lowest prevalence of destabilizing poverty; where these municipalities increase non-investment spending for the operations of their schools, they have a lower than usual rate of educational failure.
- In municipalities with the highest prevalence of destabilizing poverty, the relationship with non-investment spending is the opposite, but insignificant. ORPs struggling with poverty with higher spending also have a higher prevalence of educational failure. This may be caused, among other things, by the fact that ORPs with high failure rates operate small segregated or semi-segregated schools that are expensive to run (non-investment expenses also include heating, etc.).
- Socially and economically weak municipalities (the upper quartile of destabilizing poverty) with high non-investment transfers from the state for pedagogical and supporting staff manifest slightly reduced failure rates. The difference, however, is extremely small.

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<sup>14</sup>) Due to the low number of observations and the large number of tested variables, the relationships among the variables cannot be meaningfully statistically tested on this level.

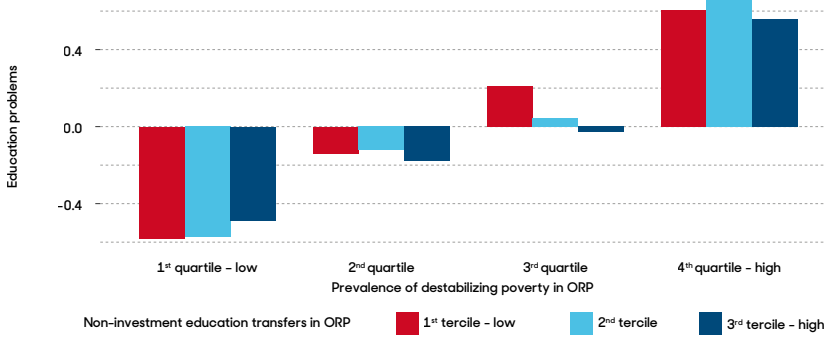
### Chart 6: Municipal non-investment spending and education problems according to the prevalence of destabilizing poverty

Source: Czech School Inspectorate, Czech Statistical Office, Ministry of Education, Youth and Sports, Agency for Social Inclusion, Social Housing Platform, authors' calculations



### Chart 7: State non-investment transfers and education problems according to the prevalence of destabilizing poverty

Source: Czech School Inspectorate, Czech Statistical Office, Ministry of Education, Youth and Sports, Agency for Social Inclusion, Social Housing Platform, authors' calculations



## Summary:

- The results of the quantitative analysis indicate certain relationships between school funding and the social situation in ORPs. That being said, these relationships are weak.
- Municipal school funding seems to be more effective in richer areas where the schools are renovated, and where their operators are able to use the funds to reduce the already low educational failure rate.
- ORPs with a high degree of destabilizing poverty benefit slightly if they receive more funding from the state for pedagogical and non-pedagogical staff. They often do not receive, however, such funding (see Chart 5 – low relationship between destabilizing poverty and funding) and the effect is extremely small – in many such municipalities, transfers from the state are not used efficiently to reduce the educational failure rate.

Additional research using more detailed data and time series should seek answers to the following questions:

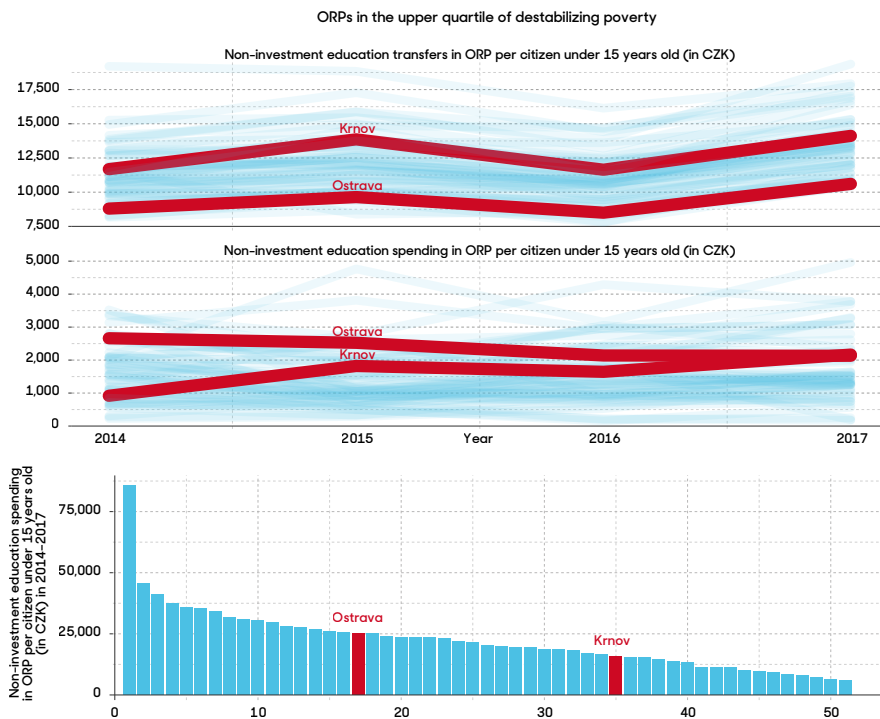
- Is education funding used to help students who need it?
- Does increased funding positively affect the quality of education (and under what conditions)?
- How are teaching assistants (and other supporting staff) funded, and what role do they play in reducing educational inequalities?

## Positive Examples of Municipalities in Combating Educational Failure

A quantitative analysis did not indicate any strong link between the amount of funding for schools and educational inequalities at the ORP level. There are known recent cases, however, of individual ORPs which have managed to improve their educational results and reduce inequalities through efficient use of funding and other measures improving cooperation and communication. This chapter introduces two such cases – the ORPs of Krnov and Ostrava. Among regions with similar social problems, these do not rank among the best in terms of education spending (Chart 8).

### Chart 8: Non-investment spending and transfers in Krnov and Ostrava

Source: Czech School Inspectorate, Czech Statistical Office, Ministry of Education, Youth and Sports, Agency for Social Inclusion, Social Housing Platform, authors' calculations



#### Krnov

The Krnov micro-region has social problems that have the potential to reduce the student success rate in education. Despite its disadvantages, it has employed effective policies at least over the last 5 years to reduce educational inequalities. The main tools used by ORP Krnov for targeted assistance to students, families, schools, principals and pedagogical staff include especially the work of members of the Local Action Plan – Krnov, adherence to the Local Inclusion Plan and long-term follow-up projects for support and cooperative development of inclusive education in Krnov using various operational programs.

The most important interventions identified by the Krnov working group on education (responsible for implementing the Local Inclusion Plan) included tutoring of special needs students in schools and NGOs, cooperation between elementary school teachers and tutoring club staff, using extensive experience on the part of some NGO employees with educating students from socially excluded backgrounds, and the operation of a preschool center in a socially excluded area. All these interventions were key to ensuring not only

secondary school attendance, but also adaptations on the part of families (many of them Roma) and integration of their children into formal education. Krnov also operates an informal preschool center in a socially excluded area which works with children who would otherwise not attend a kindergarten. Apart from the high degree of competence on the part of the teachers, Krnov also benefits from quality tutoring and summer interest group activities that prevent a drop in the students' learning habits.

Despite the high prevalence of debt collection procedures in ORP Krnov, which our analysis revealed to predict educational failure, the targeted interventions have successfully reduced educational inequalities and created meaningful opportunities for disadvantaged children thanks to leisure time activities. Schools are also supported by providing sufficient staffing with teaching assistants, psychologists, special pedagogues and the pilot position of a school inclusion coordinator.

### **Ostrava**

The statutory city of Ostrava is divided into 23 municipal districts, nine of which contain socially excluded areas or public housing facilities for the poor. These places are situated either in dense urban areas or in locations that are spatially separated and closed off. Thus, social and educational inclusion takes place in diverse conditions and reflects the spatial concentration of disadvantaged children. This has recently led to a redrawing of school catchment areas, the dissolution of a segregated elementary school in Ostrava-Poruba and the transfer of its children to other nearby schools. Segregated schools and classes still constitute, however, a problem in this ORP. The municipal district of Moravská Ostrava and Přívoz, which is also its own school district, is on the other side of the desegregation spectrum. Due to spatial segregation, there are schools with high numbers of (especially Roma) children from the socially excluded neighborhood of Přívoz, as well as schools that socially disadvantaged children do not attend.

A SWOT analysis of the Ostrava Local Inclusion Plan has identified dozens of weak points. Apart from the aforementioned, these include unwillingness of schools to accept children from socially excluded backgrounds, a lack of kindergarten capacity in the disadvantaged areas coupled with low kindergarten attendance, teacher disinterest in inclusive education and further professional growth, lack of specialist staff in schools (e.g. psychologists and special pedagogues), a low degree of cooperation between schools and NGOs and the unavailability of school clubs.

In response to the analysis, Ostrava is planning a number of measures based on its [Local Action Plan](#) and [Local Inclusion Plan](#), both funded from an EU operational program. As the city is a regional capital, the City Hall has limited power over the individual municipal

wards, which, however, are the ones who operate the schools. Similarly as in Krnov, Ostrava is interested in supporting preschool work with children from the excluded area using preschool centers, educational events for parents, and sufficient school assistant staff. To support the educational outcomes of disadvantaged students, Ostrava has reinforced the school counseling center with specialized staff (psychologists and special pedagogues), home tutoring and informal clubs. It also trains the teachers in inclusive education. The ORP also plans to create the positions of an inclusion coordinator and teaching assistant methodologist for individual municipalities and implement teacher study trips abroad, as well as build up stakeholders' networks (student – family – body for social and legal protection of children [BSLPC] – Labor Office – NGOs) promoting good cooperation and preventing drop-outs from mainstream education. It should be mentioned that a drop-out may be caused by economic pressures (the need to bring in money to supplement the family budget or to make a living on one's own, etc.) – which means it is important to link and coordinate education and social policies.

## The Impact of Covid-19 and Distance Learning on Education Quality in Regions and Educational Inequality

The pandemic and the ensuing need to switch to distance learning has increased inequalities in education not only due to the fact that students from disadvantaged backgrounds receive lower learning support at home, lack modern communication equipment and more frequently attend poor-quality schools, but also due to the impact on municipal budgets. The main financial impacts of the pandemic, which threaten to influence educational inequalities, are the following:

- **Computer equipment in schools and households**

The operators of schools (mostly municipalities) play a key role in providing funding for computer equipment and can help co-fund such tools in households. From a technical perspective, elementary and secondary schools were not ideally prepared for distance learning. Only 19% had a school information system accessible remotely by parents and students that could facilitate distance learning online. Less than half used some kind of online platform for teaching. Many teachers also did not have their own laptops and when they did have one, the computers were often inadequate for the needs of distance learning. The positive news is that, according to studies,<sup>15</sup> the lack

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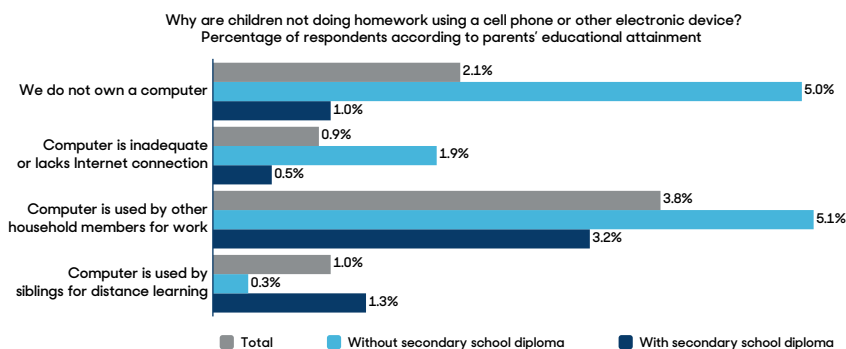
15) Czech Schools Inspectorate. *Vzdělávání na dálku v základních a středních školách (Distance learning in elementary and secondary schools). Tematická zpráva (Thematic Report)*, 2020.  
FEDERICOVÁ, Miroslava and Václav KORBEL. *Pandemie covid-19 a sociálně-ekonomické nerovnosti ve vzdělávání (Covid-19 pandemic and social and economic inequality in education)* [online]. May 2020 [retrieved on: 2020-09-27]. Available at: [https://idea.cerge-ei.cz/images/COVID/IDEA\\_Nerovnosti\\_ve\\_vzdelavani\\_COVID-19\\_kveten2020\\_18.pdf](https://idea.cerge-ei.cz/images/COVID/IDEA_Nerovnosti_ve_vzdelavani_COVID-19_kveten2020_18.pdf).



of computer equipment in schools was not worse in socially disadvantaged regions. Socially disadvantaged families, however, more frequently lacked such equipment, or it was inadequate. The percentage of children without the necessary computer means ranged from 3% to 10% in the spring; it was more pronounced in socially disadvantaged families<sup>16</sup> as shown by Chart 9. A continuing pandemic could result in repeated closures of schools, which underlines the need to supply proper equipment to schools and households. This will be more acutely felt in areas with more pronounced social problems. The CZK 1.3 billion in funding allocated by the Ministry of Education, Youth and Sports could help, but these funds (CZK 20,000 per teacher) do not make provisions for different regional needs.

### Chart 9: Changing parents' views on education

Source: Distance learning in the parent's perspective survey conducted by PAQ Research and IDEA



- **A drop in funding from the budgetary allocation of taxes (BAT)**

Funding will drop for two reasons. First, the economy will contract, leading to lower tax yields. The Czech National Bank<sup>17</sup> expects the economy to contract by 8% in 2020. The second reason lies in the government steps that will impact municipal budgets. One, and the most significant, such step consists of abandoning the “super-gross

16) KORBEL, Václav and Daniel PROKOP. Vzdělávání na dálku pohledem rodičů: Report z longitudinálního výzkumu o vzdělávání navazujícího na šetření EDUin z prosince 2019 (Distance learning from the parents' perspective: A longitudinal study education report based on EDUin survey of December 2019). *PAQ Research* [online]. 20. 5. 2020 [retrieved on: 2020-09-27]. Available at: <https://www.paqresearch.cz/post/vzdelavani-na-dalku-pohledem-rodicu>.

17) KRÁL, Petr. Hloubka poklesu ekonomické aktivity ve 2. čtvrtletí 2020 zhruba odpovídala prognóze ČNB: Komentář ČNB ke zveřejněným údajům o HDP za 2. čtvrtletí roku 2020 (Depth of the decline in economic activity broadly in line with the CNB forecast in 2020 Q2: The CNB comments on the GDP figures for 2020 Q2). *Czech National Bank* [online]. 1. 9. 2020 [retrieved on: 2020-09-27]. Available at: <https://www.cnb.cz/en/public/media-service/the-cnb-comments-on-the-statistical-data-on-inflation-and-gdp/Depth-of-the-decline-in-economic-activity-broadly-in-line-with-the-CNB-forecast-in-2020-Q2>.

salary” concept used in the Czech Republic and introducing a 15% flat income tax, which is expected to reduce the state’s income by at least CZK 70 billion.<sup>18</sup> In terms of educational inequality, a reduced budgetary allocation of taxes could more seriously impact municipalities with more pronounced social problems; these municipalities might prioritize other expenses, such as those associated with social problems.

- **Lack of pedagogical and non-pedagogical staff**

The Karlovy Vary, Ústí and Central Bohemian administrative regions reported the highest demand for new teachers (10–12%). In addition, the Karlovy Vary and Ústí regions had more difficulties stemming from the lack of qualified and certified pedagogical staff.<sup>19</sup> According to the latest data, structurally disadvantaged regions had more serious school staffing problems. This could result in trouble for both in-class and distance learning. Due to more difficult (in terms of hygiene and teaching skills) conditions of in-class teaching, smaller schools with lower numbers of teaching staff struggle to provide quality education under such conditions. If some students or classes are quarantined, and teaching is partially moved online, teachers will find it difficult to reconcile the needs of the two types of teaching. In better staffed schools, teachers will be able to help one another better. Finally, if Covid-19 spreads and closely cooperating pedagogical and non-pedagogical staff are put under quarantine, it will be increasingly difficult for schools to continue with in-class teaching. All these situations may lead to reduced teaching which will more seriously affect socially disadvantaged students. This is aggravated by the fact that the pandemic is likely to last for a prolonged period of time. In this sense, positive NGO initiatives such as the one led by People in Need (*Člověk v tísní*), which ensures tutoring for disadvantaged children by university and college students, can better and faster mitigate some impacts of teaching interruptions compared to governmental initiatives, although in a limited territorial scope.

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18) Ministerstvo počítá kvůli zrušení superhrubé mzdy se snížením daně z příjmu, řekla Schillerová (The Ministry counts with a lower income tax due to the abandonment of super-gross salary, says Minister Schillerová). *IROZHLAS* [online]. 7. 8. 2020 [retrieved on: 2020-09-27]. Available at: [https://www.irozhlas.cz/ekonomika/superhruba-mzda-zruseni-schillerova\\_2008071008\\_zit](https://www.irozhlas.cz/ekonomika/superhruba-mzda-zruseni-schillerova_2008071008_zit).

19) MARŠÍKOVÁ, Michaela and Václav JELEN. Hlavní výstupy z Mimořádného šetření ke stavu zajištění výuky učitelů v MŠ, ZŠ, SŠ a VOŠ (Main results of the extraordinary survey of the state of teaching in kindergartens, elementary, secondary and higher vocational schools). *Ministry of Education, Youth and Sports* [online]. 21. 5. 2020 [retrieved on: 2020-09-27]. Available at: <https://www.msmt.cz/ministerstvo/novinar/ministerstvo-zjistovalo-stav-ucitelu-v-regionalnim-skolstvi>.

## Public Policy Recommendations

- **Well-considered investments in education** – our quantitative analysis indicates that the rate of educational failure is not affected by higher spending, investments and transfers by ORPs struggling with a higher proportion of families subject to debt collection procedures. More research is needed to understand these relationships over time. It is clear, however, that apart from the overall amount of spending, it needs to be better focused on key issues. We recommend:
  1. focusing on microregions, i.e., on individual struggling ORPs, not on the entire administrative regions;
  2. boosting funding in municipalities struggling with social problems that most strongly contribute to children’s educational failure (high prevalence of destabilizing poverty, widespread debt collection, housing distress);
  3. channeling the funding into supporting professions and programs which, based on international evidence, help reduce educational failure (see the other recommendations).
- **Interdepartmental solutions** – social problems affect the students’ motivation and conditions for learning due to the families’ attitudes (to formal education, based on cultural and language differences), as well as practical limitations (housing distress, stress, frequent moving, financial barriers, more frequent sickness, absences, etc.). Solving these challenges requires a combination of social and education policies that comprehensively address the living standard of families and communities. Specific instruments supporting integration include e.g. debt relief, better availability of decent municipal housing (including rapid rehousing programs to address families’ housing distress), and reducing the total cost of work for the least paid jobs.
- **Preschool education** – children at risk of social exclusion profit the most from preschool education, especially if they attend for at least two years prior to starting elementary school – it thus constitutes one of the best investments in reducing educational inequality.<sup>20</sup> We therefore recommend the broadest

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20) MELHUIISH, Edward, Katharina EREKY-STEVENS and Konstantinos PETROGIANNIS. A review of research on the effects of Early Childhood Education, and Care (ECEC) upon child development. *CARE project: Curriculum Quality Analysis and Impact Review of European Early Childhood Education and Care (ECEC)* [online]. January 2015 [retrieved on: 2020-09-27]. Available at: [https://ecec-care.org/fileadmin/careproject/Publications/reports/CARE\\_WP4\\_D4\\_D4\\_1\\_review\\_of\\_effects\\_of\\_ecec.pdf](https://ecec-care.org/fileadmin/careproject/Publications/reports/CARE_WP4_D4_D4_1_review_of_effects_of_ecec.pdf).  
OECD. *Equity and Quality in Education: Supporting Disadvantaged Students and Schools* [online]. 2012 [retrieved on: 2020-09-27]. Available at: <https://www.oecd.org/education/school/50293148.pdf>.

possible support for timely and quality preschool care for children in ORPs with greater social problems and for children with a mother tongue other than Czech. This involves ensuring territorial availability and affordability, quality and motivation on the part of parents to use these services.

- **Support for inclusive education** – legislative entitlement for supporting measures needs to be robust in order to compensate schools for the teachers' time and other human and material resources expended to support children with special educational needs. Specifically, support should be individualized, and the skills of teachers and principals need to be developed through further training of pedagogical staff for work with diverse groups of children. Predictability of budgetary income also plays a significant role in this regard.
- **Local Action Plans/Local Inclusion Plans** – preparing conceptual documents to support inclusive education linked to funding represents good ORP practice that reduces educational inequality. ORPs can also connect local inclusion stakeholders (schools, NGOs, counseling centers, parents, etc.) and organize public events on education in disadvantaged parts of their districts.
  - **Good practice** – e.g., preschool clubs, staff reserved for communication with a preschool child's family, educational activities for parents, tutoring clubs, support for specialized (non)pedagogical work in the field and in schools, and further training of pedagogical staff in inclusive education.
- **School counseling centers (SCC) and social pedagogues** – SCCs organize the work of additional needed pedagogical staff: counselors, school prevention methodologists, school psychologists, special pedagogues and school speech therapists. Their cooperation leads to coordinated support for students in need, prevents educational failure and improves working with families.
  - **Social pedagogue** – a position not yet defined in the *Pedagogical Staff Act* and, therefore, lacking funding from the state budget (funding is provided exclusively from EU sources). Social pedagogues provide tailored casework aimed at helping individual students, including in their family environment.

- **Flexible educational paths** – people without completed secondary school are at serious risk of unemployment and constitute (in economic terms) a significantly higher financial burden for the state.<sup>21</sup> For this reason, it is important to make it easier for them to improve their qualifications and support lifelong learning in sectors that will cease to exist or will be significantly impacted by economic shifts and automation.
- **Indexed funding** – the state is currently unable to easily identify schools attended by students with a lower socioeconomic status and students living in substitute care. To help these students perform the same as their peers, the schools need to be provided with additional resources. The state should thus follow the example of other countries (e.g., identify students in need by their entitlement to free lunch as in the UK) and detect and monitor the life situation of students and apply, based on their knowledge and skills (and educational progress), targeted learning support.
- **Stable funding** – education spending contributes extremely effectively to the country’s development. Funding should therefore be stable, predictable and not substantially sensitive to the ups and downs of the economic cycle. The crisis caused by the Covid-19 pandemic has revealed that the resulting economic downturn and lower budgetary allocation of taxes can destabilize education funding. It is possible that municipalities with reduced budgets will be forced to prioritize and postpone important investments. The state should thus incorporate anti-cyclical mechanisms to mitigate the impact of economic crises and should not aggravate economic hardships by further risks following from ad hoc and late decision-making.

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21) OECD. *Equity and Quality in Education: Supporting Disadvantaged Students and Schools* [online]. 2012 [retrieved on: 2020-09-27]. Available at: <https://www.oecd.org/education/school/50293148.pdf>.

# Aspen Young Leaders

## An Opportunity to Reinvent the Central European Art Market

**Anna Povejšilová** Specialist, Head of Works on Paper Sale, Impressionist & Modern Art, Christie's  
**Barbora Půlpánová** Founder, EDUART EXPERIENCE

Global art fairs with collectors traveling across the world, blockbuster exhibitions involving international loans and largely event-driven art business became near-obsolete at the outset of the pandemic. A new lifeline materialized in the digital environment, which the broadly conservative art market had tried to avoid as long as possible. In the first half of 2020, online-only auction sales increased by 497% and total online sales volume for galleries grew from 10 to 37%, according to the Art Basel and UBS *Art Market 2020* Report. Traditional rivals have been forced to collaborate in order to cut costs and share clients, as well as create wider platforms to support their smaller business peers. Displaying art works with their price or price range has become more common, resulting in greater transparency.

The pandemic has radically accelerated the changes that the art world was slow to adopt compared to other industries, leading to a more accessible and digestible environment. Galleries and auction houses have been creating sophisticated digital technologies and captivating content, including viewing rooms and virtual exhibitions, to reach a wider audience with an educational context. According to the Report, 59% of the collectors surveyed said the pandemic had increased their collecting interest and 70% of millennial collectors said they now felt more inclined to buy art online.

Online sales cannot fully replace, however, traditionally more lucrative live auctions and the experience of buying art in person. The after-effect of this pandemic era might be a hybrid landscape with online and offline activities mutually strengthening one another, which goes in hand with various environmental initiatives. With global fairs and international collaborations moving online, and a greater involvement in innovative and interactive local events, the new art world will emerge more sustainable, well-educated and interested in pure art.

Now is the right time to rethink current art business strategies in Central Europe – a region still predominantly focused on national markets with few international

interactions. There are numerous similarities between the Czech, Slovak, Polish and Hungarian art markets, which have yet to reach a thoroughly international level. There is a great potential for successful collaborations, bringing regional art communities together. Not only are international collectors increasingly recognizing the quality of Central European art, but also local collectors are becoming more seasoned and eager to refine their collecting habits. It will be fascinating to see how the art scene in Central Europe evolves in the wake of such unprecedented, radical change. These shifting times will undoubtedly contribute to a more interconnected market in the region, which in turn will continue to strengthen its position internationally.

## Cities after Covid-19

**Eszter Dávida** Architect, KÉK - Hungarian Contemporary Architecture Centre

As an architect and urbanist, I wish to reflect on the changes in private and public spaces and their relation to local communities. When the lock-down became a reality in Hungary, we experienced social cooperation on a scale which had not been witnessed for a long time in the country. Merely out of self-motivation, we began to collect good practices on how to overcome various Covid-related situations. It soon developed into a project: a database of local and international examples from different sectors and activists.

The “innovations” came firstly from local communities and private companies – which is quite understandable if we consider the flexibility and resilience of these groups – and consequently reached the institutions and municipalities.

The most important phenomenon is the shift in borders between private and public spaces. If we think about the 1.5-2 m social distance requirement, it is a challenging restraint for individuals as it is not a typical social distance in Central European culture. Many good examples, however, have been born: tools and gadgets to maintain distance between people (like wings for kids in school), or signs in community places (like circles in squares or parks or 1.5m-distant layouts in theaters).

The biggest change occurred, however, within the communities themselves. Our private places like balconies or corridors began to work as semi-public places. Because of the lock-down, community life acquired new territories and in many residential buildings the never- or rarely-used spaces came alive. Small communities began to cooperate: they

renewed their shared places (like gardens), organized cultural programs (like small concerts or film screenings) and formed neighborhood support groups.

The same thing happened in public spaces, only on a larger scale: communities, local small and mid-size enterprises (SMEs) or municipalities began to use the abandoned places or gave them new purposes. During the lock-down, many SMEs could not receive guests indoors but could offer their services outdoors; thus unused public spaces like parking lots or parts of streets and squares became cafés and stores. We could also see public spaces like streets being turned temporarily into playgrounds for kids. One good lesson which can be taken from these steps is that communities and new ways of use of public space can bring about a major change without huge investments. As a reflection on the Covid-19 pandemic, a theory of 15 minutes cities emerged – we should create cities where an inhabitant can reach every daily service in need in 15 minutes.

In summary, the positive effects of the Covid-19 pandemic on communities and public spaces are: a sensitive use of public spaces, the re-discovered importance of green spaces in cities, learning new ways to use public spaces through implementing small-scale changes that affect the whole and raising discussions about the sustainability of cities.

I also think that improvement in work with small communities is an important direction in the post-pandemic world. We need huge urban scale planning and regulations, of course, but they should rely on the power of local communities to a much greater extent.

## Conclusions from the Pandemic

**Lukasz Pawłowski** Political Commentator, former Head of the Political Section, Kultura Liberalna

There are multiple conclusions we might draw from the pandemic and these ongoing months of quarantine, self-isolation, economic hardship and fear. One of the most important discoveries, however, should be the value of international cooperation.

At the beginning of the pandemic, most European countries either ignored the danger, or believed they could handle it on their own. Only after witnessing the magnitude of the crisis, the European Union began coordinating its efforts more efficiently. This delay, however, caused much resentment in most Member States. Many right-wing politicians and pundits maintained that the pandemic revealed how weak the EU was and that nation states were forced to act in its stead.

“Unfortunately, the EU has not given us a single Euro cent to fight the virus”, Polish Prime Minister Mateusz Morawiecki stated in a speech to parliament on 27 March 2020. “In



times like these, difficult times, one can see that nation states are the most important. And the EU reaction is what it is”. Morawiecki’s claim was false even at that time and was disproven even further with the ongoing help coming from Brussels.

Yet, that was the dominant belief of the day: the EU had failed and the nation states were left out in the cold. In a pan-European poll – commissioned by the European Council on Foreign Relations and conducted in the last week of April – only 14% of Italians “agreed” or “strongly agreed” that the EU had lived up to its responsibilities during the pandemic. In other surveyed countries (nine of them in total) these views were slightly more positive (32% in Poland, 36% in Portugal), but hardly impressive. On average, only 22% of respondents were satisfied with the EU’s reaction to the crisis.

Interestingly, though, when asked, “How the coronavirus changed your attitude towards the EU”, 63% replied that it has “shown the need for greater European cooperation”. In Portugal, 91% of respondents agreed with this statement and in Italy it was 77%.

This may look like a paradox at first sight but it is in fact a coherent position – people were disappointed with the initial EU reaction but apparently attributed it to the lack of coordination and the absence of proper tools the EU institution had at its disposal. This view seems to be in line with Chancellor Angela Merkel’s remark that in the face of current, global challenges “the nation state has no future standing alone”.

I believe this recognition – that our nation states need to work more closely together – to be one of the most important conclusions we as Europeans ought to draw from the pandemic. It should appeal not only to those already supportive of a stronger EU but also to those who have been skeptical about the idea. The pandemic – along with other global challenges such as climate change, migration, or increasing tensions in our relations with China – can help us see the EU as what it should be: not as a threat to our national sovereignties but as an indispensable tool to defend them.

## The Pandemic Has Opened Up Opportunities for Speeding Up Positive Change

Marek Sacha CEO, XOM Materials / Co-Founder, Board Member, Cera Care

The pandemic made room for positive change in governments and industry in Central Europe. Now we know many tasks can move online for public safety—the UK’s online passport applications, for example—so why don’t Central European leaders push for efficient,

eco-friendly solutions? Our changes come too slow, leaving money on the table and Central Europe under-prepared for future crises.

Central Europeans are very talented. Our talent needs focus and courage to pull us into the post-Covid world. We must take a critical look at the entrenched way we think about digitization.

One of my companies provides digital solutions for the materials industry—which, until Covid-19, relied on face-to-face meetings. With trade shows canceled and sales calls inadvisable, the industry has moved interactions online. Our clients see that digitizing the supply chain really is cheaper, efficient and eco-friendly. It is also more future-oriented than unpopular layoffs.

We must adapt clever solutions to broader uses. In early 2020, the UK had 120,000 care sector vacancies. The country quickly adopted digital efficiencies, such as electronic signatures.<sup>1</sup> Perhaps this is why the Department of Health and Social Care speedily asked my UK company to help hire and train health care workers. We built on existing technology and, in only months, created an online service that matches candidates—many newly unemployed<sup>2</sup> in other Covid-impacted industries—with tens of thousands of jobs. This is the type of digital opportunity we need decision-makers to recognize.

Central Europe should go beyond popular Software as a Service to assist digital economy driving pandemic recovery. We have the ability to innovate and move beyond the usual “langsam aber sicher” — slow but sure.<sup>3</sup> Great examples are Rohlik.cz from Tomáš Čupr and Cesko.Digital from Jakub Nešetřil. We need to digitize even the most traditional industries, like manufacturing. A good start would be supporting design innovation instead of rewarding industries that marginally improve the status quo but do not move us into the post-Covid future. Instead of a “new” diesel engine that works, say, five percent more efficiently, society actually needs to disrupt the industry and come up with completely novel solutions. Our talent does well with tech companies; we can transform society as well. With these changes, we will emerge stronger, happier and more flexible.

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# Social Cohesion – What We Learned from the Crisis

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Resilience is a buzzword around the EU, OSCE or UN circles. But what is it actually? The general resilience of the whole of society evades an easy definition. It is a huge thing to define.

I see it as a pyramid.



Institutions are well understood. We need courts or hospitals. The collective identity is less obvious for many, but it is intuitive – we need shared values, stories and social norms that bind us together, so we can share a sense of belonging to a group – from a family to civilization.

Social cohesion can be translated as a level of trust inside a group. Horizontal cohesion is trust between members of a group in general while vertical trust is hierarchical – trust in leaders and institutions. Cohesion is a key element of our ability to cooperate. And it is on a long-term descent in Central-Eastern Europe. Especially the vertical one.

Trust in institutions is crucial, since some of the most important cultural innovations of the modern era – such as governmental legitimacy based on voting or an economic system using paper and digital currency guaranteed by states – relies mostly on trust in institutions. ONLY if there is trust, will our modern era as we know it survive. Unfortunately, the benefactors of the modern era – both institutions and individuals – often forget that trust has to be earned.

The pandemic has demonstrated this all too well. The fault line between those who were willing to obey the safety precautions for the elderly, wear masks and follow the rules of the quarantine went hand in hand with their perception of the legitimacy of governmental institutions.

Can you see how the three sides of the Resilience pyramid interlock? The sense of belonging needs trust (otherwise there is no cooperation) and cooperation is more effective with good management, good management creates an environment that supports trust and trust empowers a sense of belonging.

We need to pay attention to social cohesion, or the pyramid breaks. Cohesion takes time, which means we need to cultivate long-term thinking. And we are in sore need of that in this era of hasty lifestyles, 1-year NGO funding cycles and 4-year political party ruling cycles.

Do you know who understands this problem the best? Authoritarian countries with an imperial history. It is an existential need for democracies to develop long-term thinking, or the democratic experiment, only some 200 years young, may cease. Be on our watch.

## Why Is a Green Economy Crucial for Central Europe Right Now?

Alexandra Střelcová Co-founder, Haenke

Humanity has evolved around nature, which is why we constantly feel the urge to connect with it. Decades-long studies have indeed proven that spending time in nature has positive effects on people's health: as little as two hours somewhere in the woods can significantly reduce stress, lower blood pressure and improve our mental well-being.

One thing that the pandemic has not managed to smother is the human inner need for anything green. Perhaps you wondered – stuck in your homes in the middle of the lockdown that sent the global economy into historic mayhem – how to get away from all that stress, if only to a nearby park. Sales of basically anything related to nature – from house plants, cottages to entire islands in the Caribbean – have spiked by numbers even Google Trends could not follow. While busy stitching face masks and getting groceries for our elderly neighbors in the extraordinary atmosphere with almost war-time nostalgia, we realized how important nature was, more than ever before.

Despite initial hesitation, business opportunities with sustainability at heart have proliferated with unparalleled drive. Yet despite signs from both the public and the business sector, suggesting that protecting nature should in fact be on top of government priorities, representatives from Central Europe called for an abandonment of the *European Green Deal* in order to finally focus on solving real-world problems instead of trying to save the planet.

The problem with climate crisis is – to quote Mark Carney, former Governor of the Bank of England – that it imposes costs on future generations which the current generation has no direct incentive to fix. It should not be forgotten, however, that the economic

struggle caused by this pandemic is a direct result of the devastating impact humans have brought upon the environment, from deforestation, biodiversity loss to polluted air.

Restoring economies post-Covid will not be possible if we choose to ignore the urgent calls for further environmental protection. Preventing natural disasters is cheaper than coping with them. And this involves protecting biodiversity, promoting sustainability, and supporting businesses that choose to follow principles of a circular economy.

For the states of Central Europe, going green is not a useless caprice but a fundamental necessity. Through growing into greener economies, we have a unique chance to benefit from an increasing number of business opportunities while creating a better future for the present generations as well as for those to come.











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