

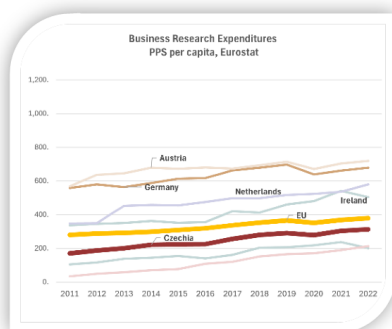
**intro
to
notes on
innovation**

A year ago, we drafted a Letter on Innovation (attached) to describe the major changes transforming the economy and to suggest ways government, universities and business could work together to take advantage of this change to increase Czechia's prosperity.

Throughout the past year, we have had the privilege to discuss our views with many individuals in the government, at universities, and in the private sector. Our discussions confirmed our conviction that the country can be a leading innovative economy in Europe, and helped us identify individuals who not only share that ambition, but have creative initiatives of their own that will help us all achieve it.

What follows is a summary from the notes taken during our session in the past year. The summary is divided into general comments, and comments on technology, people, infrastructure and government.

general notes on innovation



The amount of advanced technology developed in a country determines how innovative an economy is. This essential role is either underestimated or ignored by most of the recent economic policy initiatives by both the public sector and businesses.

Those initiatives tend to focus on fixing problems disrupting the current status quo. That status quo has depended on relatively lower wages and energy prices than Czechia's export markets. Therefore, policies aimed at maintaining the status quo could contradict policies that pursue a higher value-added and higher wage economy.

The risk of concentrating on retaining the status quo is that Czechia would need either to restrain the growth of Czech wages or depend increasingly on importing low-wage labor. Czechia would thus risk being too expensive to produce other countries' technologies and lacking the advanced technology base needed to be an innovative economy that produces the science and technology creation that drives high value-added exports, as well as a successful start-up community.

Avoiding that trap requires an economic policy that places the value-added output of the cooperation between science, technology development, and the creation of globally exported products as its highest priority. The most effective measure of that output is amount of business research investment per capita. Our aim should be to raise per capita business investment into research above the EU average before 2030.

To do so, we suggest the government consider not only a set of concrete policies, but the mindset that determines which policies to pursue. An innovative mindset includes:

A focus on outcomes, not who does what when. Innovative countries generate a substantial flow of globally competitive products based on advanced technologies that depend on progress in scientific knowledge. The process that creates such products often involves multiple failures and alterations of plans before the final success. That requires more flexibility than the current government decision and oversight processes possess.

Entrepreneurial vs. institutional approach. Governments tend to craft economy policy that satisfies the habits and needs of the implementing institution. Such an approach usually reacts inflexibly to opportunities in the market. Innovative countries identify opportunities and adapt their policies to them. This entrepreneurial type of approach suits Czechia's position as a smaller and developing innovative economy.

Political consensus. While competition is what keeps democracy healthy, compromise is what makes it effective. Any major private sector investment into the development of technologies averages a decade or more. Fears that government support will evaporate from one electoral period to another, thus, is a negative factor when deciding where to place investment. We believe most parliamentary parties would like the country to develop into an innovative economy. That desire needs to be turned into a consensus around a set of economic policies, and that consensus needs to be expressed openly and acted upon consistently.

notes on technology

As we noted in the general remarks, how many advanced technologies are developed (ie, the base of advanced technologies) determines the innovativeness of the economy. Successful development of advanced technologies depends on how much scientific research contributes to technology development, how much technology development contributes to exported products and services, and how much the economic premium created by exported products is reinvested into the scientific and technology process.

Advanced technology development connects scientific research and high value-added export. Our recommendation is to center innovative policy on increasing the development of advanced technology in the country.

Doing so would require avoiding three tendencies that tend to shape public research policy in most countries.

First, public research policy tends to skew toward scientific research over advanced technology development. This often leads to scientific research that is not connected with technology development in the country or value-added product export. This means that the benefit of that scientific research is often monetized in other economies. That limits the overall benefit to society, as well as the number of people who directly benefit from public research spending.

Second, public research funding of scientific research or applied research into technology development is distributed by multiple institutions and spread across many constituencies. This typically results in many small projects. These projects typically aim for incremental gains in science or technology. Most advanced technology projects require larger sums for both scientific and technology research.

Third, officials responsible for decisions on research funding are risk averse. Some of this risk aversion is due to how the public procurement and law enforcement process treats failure in projects or changes to how projects are carried out. Since major scientific and/or technological advances involve solving greater unknowns, such projects involve higher risk.

Czechia could design a policy that:

- 1) focuses its public research spending on major projects on scientific research and technology development that result in higher value-added export by
- 2) Cooperating with companies and/or management teams (particularly in the case of start-ups) with a track record of developing technology in Czechia and exporting it profitably to global markets, and
- 3) Setting the goal of program oversight the achievement of a series of milestones in the advanced technology development.

A commitment to funding larger projects will attract larger projects. Working with companies with a track record of development will reduce the risk for the public sector. Switching to project oversight by technology milestones aligns public administration with the goals of business and researchers.

notes on people

If we want an innovative economy, we need workforce policies aimed at generating a more innovative workforce.

We propose to switch the focus of workforce policy to the achievement of two aims. The first is to make the country the best place to work in the EU. That will make it attractive to all types of talented individuals, and increase the quality of life of Czech citizens. The second is to make the country to best place to invest in innovation in the EU. That will serve as a magnet both for Czech students to study STEM subjects, and for STEM workers to view Czechia as a place to advance their career.

The Best Place to Work in the EU

Modern technology enables people to work when, where and how they want. Regulation should enhance this ability, and not diminish it.

A modern workforce policy would enact four principles:

- Employees and employers could agree on several clearly defined employment arrangements (full-time, part-time, paid for work, etc.).
- Employers should be incentivized to compete for employees by offering benefit packages and career development.
- Employees should be incentivized to invest in the development of their expertise and health.
- Employers should be rewarded for employee policies that generate higher than average levels of long-term employment for their full and part-time employees.

The Best Place to Invest in Innovation

Innovation occurs when skill meets opportunity. The opportunity is created by a country having a large base of developing and producing advanced technology (see Technology section). Building a corresponding base of skill depends on how the government determines its cachement area for talent. If we want to be global innovators, we need to recruit from the world.

The first step is to maximize the innovative capacity of Czech citizens. We have been impressed with the plans of the Technical University in Brno, particularly their aim 1) to introduce industrial doctorates, 2) to work with secondary schools to raise the percentage of talented students that choose STEM education, and 3) to increase the quantity and quality of research cooperation with advanced technology companies.

Another good idea that we heard from the Czech research community is to expand the program of attracting young scientists. Based on the Max Planck Institut's Dioscuri program, this program would give research grants covering multiple years to young scientists. By funding these researchers, the government would not only expand the base of worldclass scientific inquiry in the country, but also would 1) improve the educational standard in the country, 2) attract both domestic and international students to study at local universities, and 3) stimulate companies to invest in more cutting edge basic and applied research in the country.

notes on people *(continued)*

A second step could be to encourage the current workforce to upgrade their skills, both digital and technological. Employees could receive tax deductions for government-certified programs that would make both them and the country more attractive for innovative investors. Companies could receive tax breaks for sending their employees to teach at adult education programs.

A third step is to create a special immigration program aimed at innovative workers (that could include, for instance, all foreign employees in companies conducting high tech research in the country) would not only allow companies to produce better technology that generates higher revenues per employee, higher average wages, and higher public revenues through taxes, but it would create higher levels of private sector research spending, including private sector projects in cooperation with public research institutions. For this reason, we propose removing innovative workers from the calculation of any quotas, and establishing a special process that reduces the approval time to weeks instead of months.

notes on infrastructure

While we recognize the importance of the government's proposed policies in energy and other vital infrastructure, our recommendations on how to develop the infrastructure focuses on improving the land use process, including its digitization.

Land Use

Land is limited in Czechia. How we use this land will determine how much prosperity we can generate per citizen. At the same time, understanding how development will affect climate change, and how it will improve or detract from our quality of life is a fundamental responsibility of the government. That is why we view strengthening the land use process as the third key element of economic policy.

Land use policy consists of three discrete stages which require different decision-making authority and expertise. The first stage planning demands political negotiations between various interests to determine how land can be used to achieve social and economic objectives. The second stage- zoning- requires technical expertise to transfer political decisions into clear rules for how each delineated piece of land can be developed. The third stage- permitting- needs administrative competence to ensure that the actual development of land adheres to the zoning plan.

Planning should receive greater emphasis in the process. The government could

- Establish national goals for economic development, environmental, transport, education access, housing and other national priorities and prioritize projects for review and funding that contribute to the achievement of those projects.
- Coordinate national, regional and municipal development goals, and create room for regions and municipalities to compete through tax and national subsidy incentives.
- Encourage digitalization of land use process by prioritizing planning projects based on digital models of land use.
- Encourage regional and municipal coordination by prioritizing projects for review and funding that are submitted by multiple authorities.
- Establish a national planning council that is headed by the Minister of Regional Development and includes representatives of all regions and cities with a population over 100,000 inhabitants that recommends 5 year priorities for approval by the national government.
- Require a land use plan from any regional or local entity that wishes to affect zoning or construction permitting if they wish to fund such activity from national budget.

In zoning, government could emphasize:

- Zoning plans should reflect national goals and relevant land use plans.
- Zoning plans should contain a complete list of all requirements for development of each plot of land within that authority. Those requirements should be reviewed at regular intervals. Technical changes to zoning plan to correct mistakes or to reflect changes in law could be made by zoning authorities, but policy changes must be made through planning process. Any changes should not be made through the permitting process.
- Citizens and relevant associations should have the ability to challenge zoning rules, but those challenges should be addressed at regular intervals and not be associated with the permitting process.

notes on
Infrastructure
(continued)

In permitting,

- Construction permit offices should have tiered responsibilities. As already established, strategic projects should be addressed at a special office. Industrial, large commercial projects (determined by meterage), and large residential projects (determined by meterage or living units) could be handled at a regional level. Municipalities could form joint offices or deal with all other permits individually. All offices would be subject to performance measurements, and the right to perform these duties could be removed by national authorities. Offices that are deemed to have decided wrongly could be subject to penalties to affected parties.
- Digitally submitted applications should receive priority processing. A deadline for mandatory digital applications should be set for 2026-2027.
- Objections to construction permits can only address technical violations to the zoning plan. Any individual or entity objecting to a construction permit should deposit a percentage of the objected development budgeted cost with the appeal. Should the appeal be rejected, the money will be used 50 % for the municipality and 50 % as a compensation to the delayed investor
- Government could consider an alternative permitting system in which the building authority and relevant authorities should only check whether the submitted documentation is produced by the authorized engineer / architect. The professionals should be insured and face major penalties / punishments, including loss of authorized status for set period if the documentation does not meet the legal requirements.
- The digital system could use AI to conduct a first review of digital applications to detect any discrepancy with zoning plan, and automatically request a correction or explanation from applicant. The proposal could then be revised prior to a final review by an official.
- Government could consider imposing a time deadline for reviewing applications that would vary by size of the project. If no decision has been made by the deadline, the applicant would be allowed to proceed with construction, but with full liability for any violations of the zoning plan.

notes on government

Digital technology provide a major tool for the collection and analysis of information by government. The government has taken major steps to unify the multiple digital systems and to improve citizen access. Digital policy still suffers from the fragmenting of authority, the difficulty in attracting and retaining talent, unresolved policies on the use of private technologies in the public sector (and for critical infrastructure), and a lack of political consensus on how digitization should be achieved.

The Fiala administration introduced the Digital Information Agency to coordinate government IT systems and provide a uniform citizen experience across multiple government authorities. Leading political figures have promised to abolition the agency if they gain power after the next elections. Constant restructuring slows digitization.

The government faces an even greater challenge than the private sector to attract and retain IT talent. It might be necessary to introduce a special compensation for certain types of expertise.

The flow of new technologies emerging from digital companies is increasing. Many of these new technologies could be essential tools for improving government decision-making and deliver of services. Early adoption of these technologies could help make the country a leader in digital government– and the digital economy. To take full advantage of these technologies, the government needs to find a way to balance security concerns with early and wide adoption of important technologies such as cloud computing.

Many of the policies governing the digital economy are being crafted in Brussels. In order to increase its influence over those policies, Czechia could make an effort to work with other Digital 9 countries on common policy approaches and standards.