CEE taking digital path to prosperity

- The fastest convergence of CEE is happening in digitalisation; the lag for this can be measured in a couple of years, rather than decades
- Digital infrastructure is relatively well developed, while CEE is not fully reaping the benefits of digitalisation, especially in eGovernment services
- Well-functioning eGovernment services could bring huge positive externalities to society and contribute to the prosperity of CEE countries

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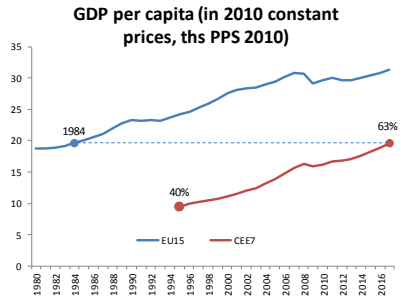
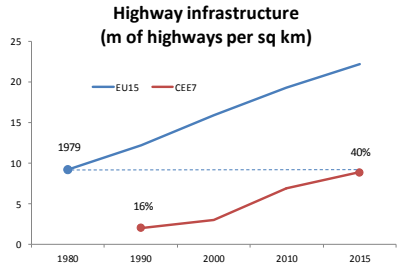
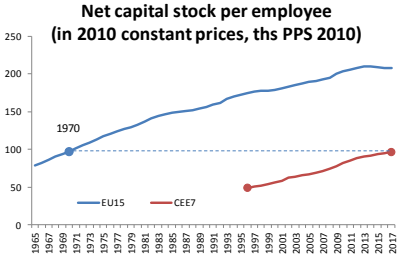
After the fall of socialism and the subsequent eastwards expansion of the EU, society had expectations that incomes and the quality of life in CEE would quickly converge to western standards. The CEE region has been outperforming the growth of Western Europe for more than two decades, which has helped the region to reduce the relative gap vs. the EU15 in GDP per capita measured in PPS by one third. However, in absolute terms, CEE7 currently has, on average, GDP per capita at the level seen in Western Europe in the mid-80s. Huge differences persist in the quality of road infrastructure, where CEE countries, despite their recent efforts and access to EU funds, have only reached the density of highways comparable to the EU15 in 1979. Convergence in areas that require a lot of physical capital seems to be taking much longer and the low level of capital stock in these economies is one of the most striking legacy issues.

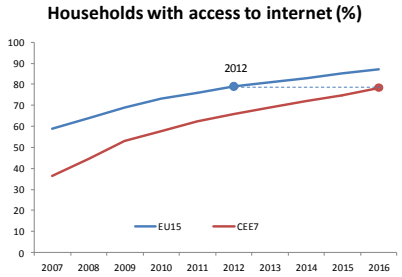
However, there is one area where the gap between CEE countries and Western Europe is much narrower and the delay is measured in years rather than decades: digital infrastructure, in which the CEE region is lagging only four years behind the EU15. Over the last decade, tremendous advances in internet access have occurred. When the CEE region was entering the European Union in 2004, only every fifth household had access to the internet. Currently, 79% of CEE households enjoy internet access. The CEE region has been advancing quickly in building broadband coverage, almost matching the coverage in Western Europe. In access to mobile broadband, the delay is only two years. While internet access speeds are generally a little bit lower in CEE, there are also some positive outliers such as Hungary, which has among the fastest 4G internet access in Europe.

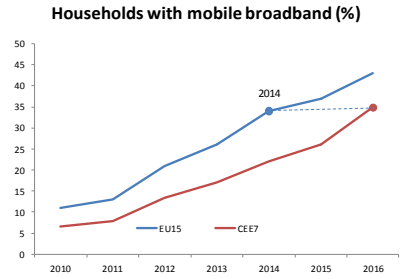
The largest gap in CEE's going digital has been identified in the sphere of eGovernment services, a fact that hinders CEE countries from making much faster progress in digital rankings. With basic computer skills and Internet usage at reasonable levels in CEE, governments there do not have a credible excuse for failing to move faster to digital. We see a lot of positive externalities for economies stemming from efficient implementation of eGovernment, as the Estonian example shows [*see Box 2 on page 6*]. Introducing eGovernment is associated with improving processes and reducing inefficiencies: interaction with public offices is much faster and more transparent, which increases satisfaction among citizens and makes doing business much easier. There is a clear positive relation between the usage of eGovernment services on the one hand and lower corruption and improved digital skills on the other. Thus, advancing the usage of eGovernment would also increase the prosperity of the region.











Source: AMECO, Eurostat, Erste Group Research

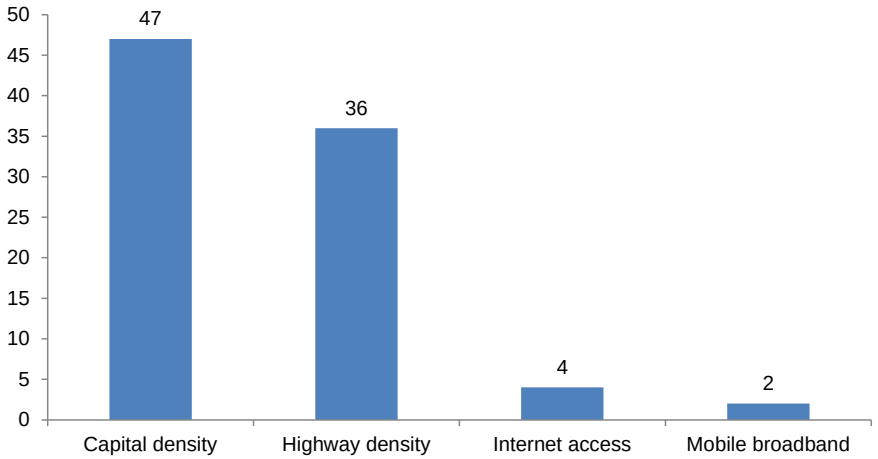
Convergence at a different speed

When it comes to economic convergence, the CEE[1] region has made enormous progress in relative terms, so called beta convergence. The CEE region has been outperforming the growth of the EU15 for nearly two decades, bringing its GDP per capita to 63% of the EU15's in 2017, from less than 40% in the mid-90s, taking differences and changes in price levels into consideration. However, in absolute terms, after adjusting for differences in price levels, the current GDP per capita of the CEE region corresponds to the level of the EU15 from the mid-80s.

Aside from incomes, highway infrastructure is another area where the CEE region, despite recent progress, has been lagging behind the Western European standard. In 2015, the density of highways in the CEE region just met the parameters seen in the EU15 in 1979. Of course, there is Slovenia, with one of the most developed highway infrastructures in the EU, but it is rather an outlier. It seems that one of the largest legacy issues of CEE countries is the low level of capital stock. Net capital stock per employee in CEE is less than half that of the EU15 and about at the level of the EU15 in 1970 when adjusted for differences in price levels.

While progressing in areas requiring a lot of physical capital, such as building highways, has always been a lengthy process, bringing digitalisation to the EU level has proven to be much faster and cheaper. In digital infrastructure, such as household internet access, the CEE region is now lagging only four years behind the EU15; in access to mobile broadband, the gap is only two years. This digital convergence gap is far smaller than the lag of 36 years seen in the density of highway infrastructure.

Number of years CEE7 is lagging behind the EU15



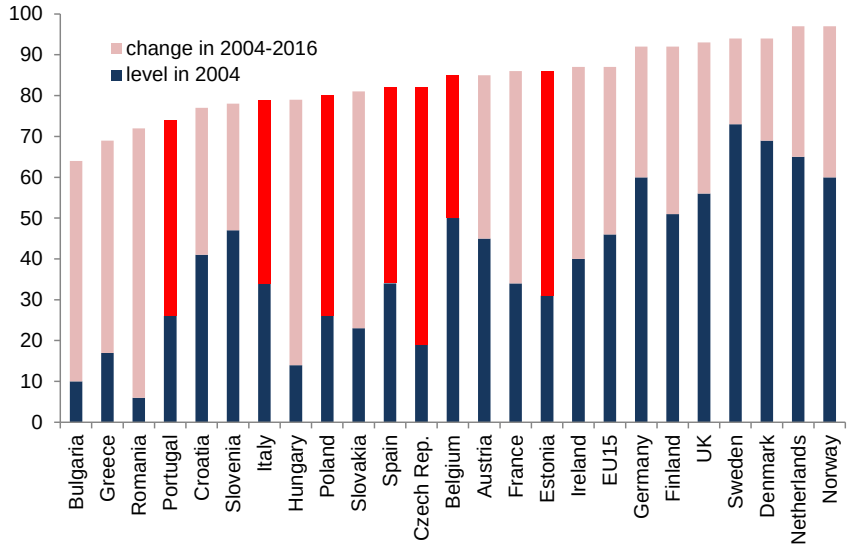
Source: AMECO, Eurostat, Erste Group Research

In connectivity, CEE countries have been doing well and gaps are closing rapidly. With 79% of households having access to the internet, CEE countries lag only 8pp (or four years) behind Western Europe. This gap is mainly attributable to lower household internet connectivity rates in rural areas of CEE; there are hardly any differences between Western Europe and CEE in urbanized areas. Investment in high-quality broadband is also a way to

[1]"CEE" refers to a group of 7 countries in this report - Croatia, the Czech Republic, Hungary, Poland, Romania, Slovenia and Slovakia.

support investment in general, with the availability of EU funds enhancing it.

Household internet access in 2016 and change since 2004 (pp)

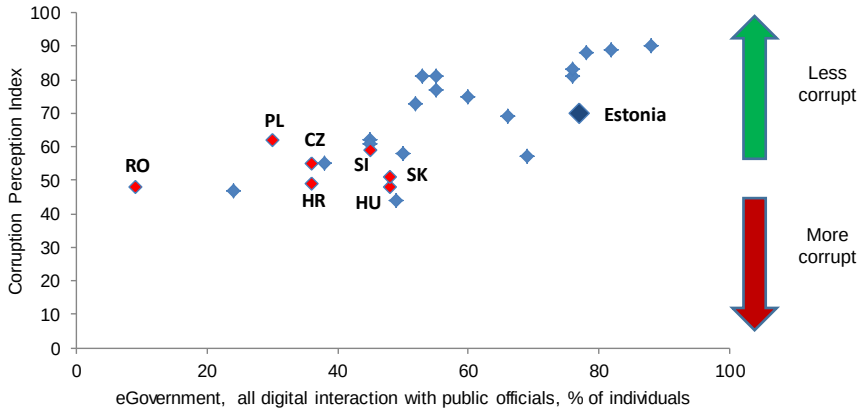


Source: Bloomberg, Erste Group Research

When it comes to the digital competitiveness of the CEE region, connectivity, digital skills and use of the internet are not seen as the major challenge. According to the latest Digital Economy and Society Index (DESI) measuring the digital performance of EU member states, CEE countries have been strongly underperforming in providing digital public services. We see huge space for CEE countries to improve in the area of eGovernment services, with a strong spillover effect into other areas of the economy and having an overall positive effect on the prosperity of the region.

There is a positive correlation between the usage of the internet in interacting with public officials and the perception of the corruption level in a country. Although it is hard to draw any conclusions on causality, it seems that digitalisation is a positive factor supporting the level of transparency in government rules and policies and empowering legal equality among citizens. Digitalisation can lead to more structured and faster processes, overall cost savings and thus higher overall satisfaction in society.

Corruption Perception Index vs. eGovernment (2016)

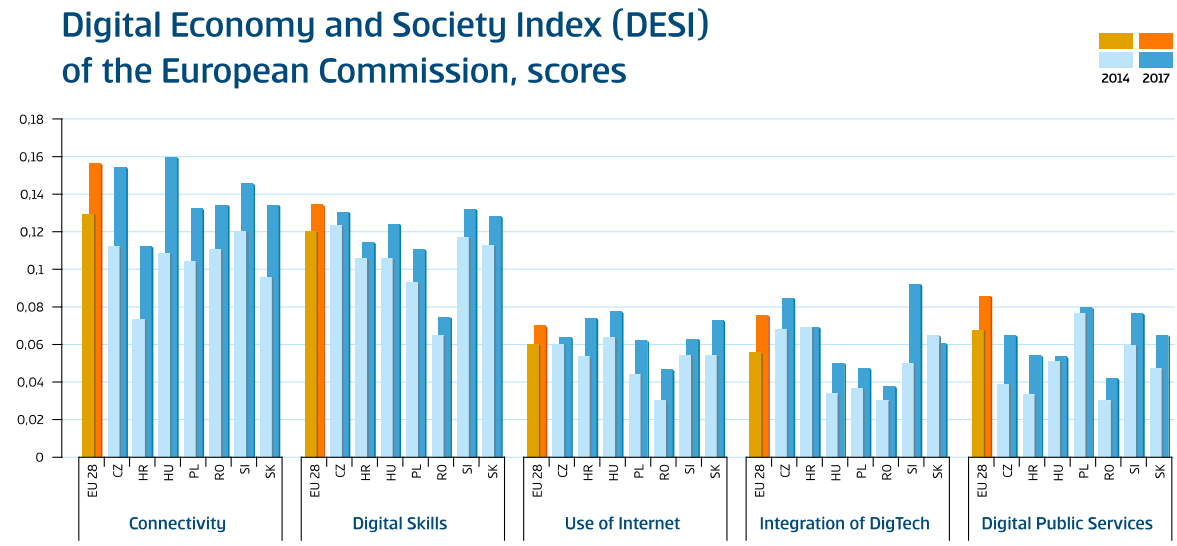


Source: Transparency International, Eurostat, Erste Group Research

Box 1: The Digital Economy and Society Index (DESI)

The European Commission's Digital Economy and Society Index (DESI) is a composite index that summarizes indicators on Europe's digital performance. The five main categories of the index are: 1) Connectivity, 2) Digital Skills (Human Capital), 3) Use of Internet, 4) Integration of Digital Technology, and 5) Digital Public Services.

The final DESI index is a simple sum of the main subcategory scores. In 2016, all EU member states improved on DESI, but Slovakia and Slovenia improved the most (more than 0.04 points vs. the EU average of 0.028 points). Still, all CEE countries remain below the EU average, with Slovenia and the Czech Republic just slightly behind the average, while Romania was at the bottom of the list of EU members.

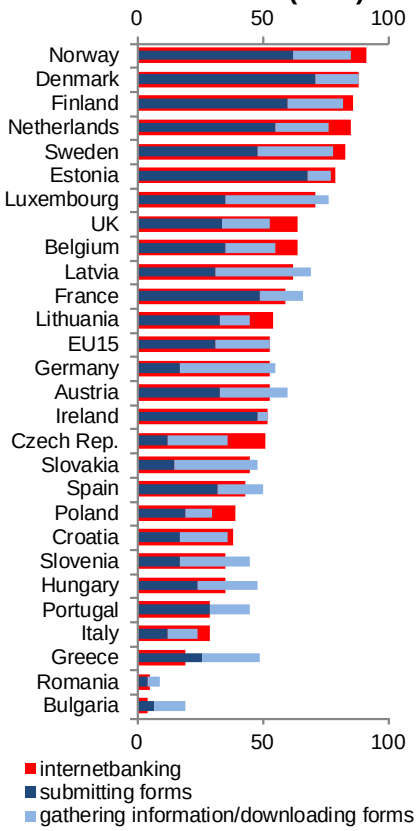


Source: European Commission

Although obviously on par with the EU average in several measures for several countries, there are notable gaps for at least one or two CEE countries in all subcategories (the least so for the Czech Republic, Slovakia and Slovenia). In addition, it is visible that all categories correlate positively with GDP per capita (mostly in Integration of Digital Technology and Digital Skills, while least so in Use of Internet).

For CEE countries, the largest gap is in Digital Public Services, as not only do all CEE countries lag behind the EU average, the size of the gaps are also the largest here. Moreover, compared with other EU countries, the Commission stated that Hungary, Croatia and Romania – all members of our CEE country universe -- are the countries on the bottom of the list in this indicator.

Share of internet banking users and individuals who digitally interacted with public authorities in last 12M (2016)



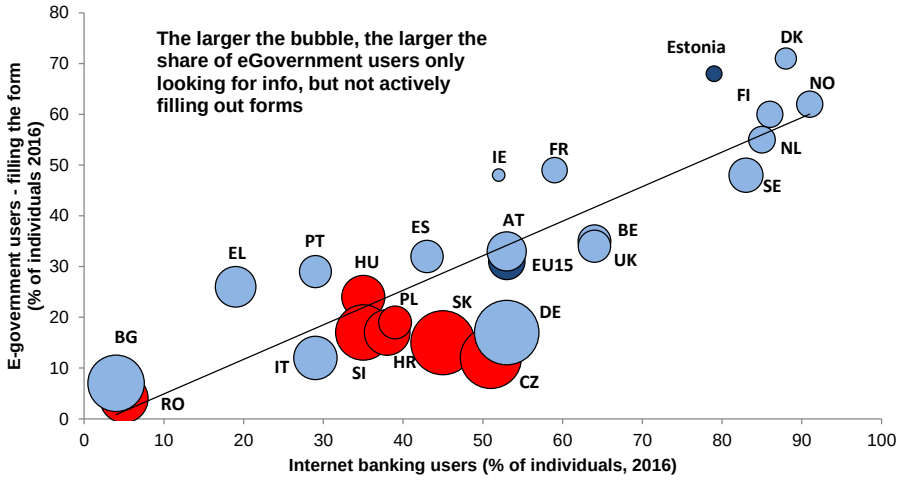
Source: Eurostat, Erste Group Bank

Most CEE countries have declared digitalisation one of their priorities and have strategies approved for the informatization of their government system. However, the level of implementation of e-services differs across the region. Overall, the number of eGovernment offerings has been increasing, but only some CEE countries have begun issuing e-ID cards (Croatia, Hungary, Slovenia and, most recently, Slovakia), while others plan to do so in the near future (the Czech Republic, Poland and Romania).

Further, in most of the countries in the region, the system remains fragmented. Instead of one entry portal complying with a once-only principle, very often there are separate systems that require re-entering personal data any time the citizen decides to use an e-service. Currently, Slovenia is the most advanced in adopting electronic public administration. Similarly to Estonia, Slovenia's state internet portal offers a unique access point for a whole range of e-services. Croatia is another example of good practice, as its e-Citizen portal provides e-services in one place as well and makes it possible to communicate with public authorities through personal email boxes. In Hungary, eGovernment has recently gained in popularity thanks to the country's central electronic administration web portal.

There is a relatively high share of individuals in CEE whose digital interaction with government offices is only in a passive form – obtaining information or downloading forms. In Nordic countries, the majority of interactions with public authorities involve submitting forms, meaning real interaction or getting a personalized service. We tried to determine whether the low level of eGovernment in CEE is attributable to a supply problem (like poor government services) or a demand problem (lack of digital skills in the population). From a comparison of internet banking users in European countries, we found that at least in the Czech Republic and Slovakia, it seems to be a supply problem, as there is a very tiny share of people who interact with public authorities by filling in forms relative to the share of internet banking users or relative to those who only gather information or download forms from web pages of public institutions.

eGovernment services are below potential in many CEE countries



Source: Eurostat, Erste Group Research

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Box 2: Estonia – leading the digital change:

Estonia has achieved unquestionable success in the digitalisation of its economy and became a leader of digital change. Its 'disconnected society' reached its biggest milestone in 2002, with the introduction of electronic ID cards and creation of the X-Road infrastructure that provides a secure data exchange layer.

It took a couple of years, however, before Estonians began to widely use the ID cards. The push came from the country's private sector, with banks and telecom companies being particularly interested in switching to electronic identification. Already prior to the 2002 launch of electronic ID cards, these two sectors, in close cooperation with the public sector, promoted the spread of the internet by offering Estonians internet training and building public internet access points. Banks' preference for digital IDs, cutting the waiting time for public services for electronic ID users, and a growing number of e-services were among the pre-conditions allowing for a diffusion of new solutions. More importantly, the adoption of governmental e-services must have been an effective process in order to be widely used.

The X-Road platform plays the central role in efficient data exchange between governmental and private services. The absence of constraints in the user interface makes the X-Road a 'decentralized' platform that, at the same time, serves as 'data storage'. Any application connected to the X-Road is able to re-use all available information that was once provided by the individual citizen.

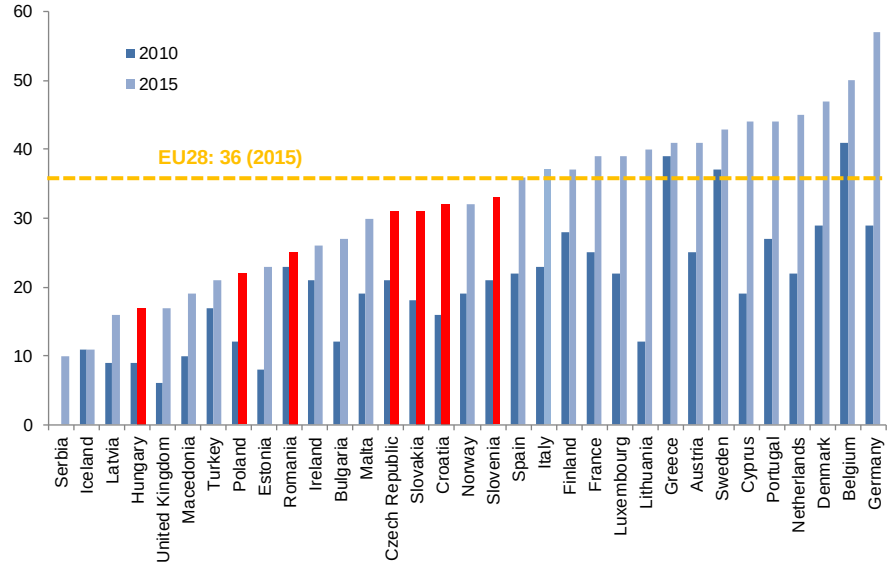
It is no surprise then that the use of eGovernment and digital public services in Estonia has increased tremendously since 2002. There are more than 500 e-services available for citizens, starting from ID bus tickets and m-parking, through e-police and e-school, ending with online voting. ID card penetration reached 97.9% and half of the population uses their ID card regularly. 95% of tax declarations are filed online and a third of the population used internet voting in 2015. Computers are in almost 90% of households and in every school and government organization. Almost all businesses use computers as well, and the share of online bank transactions is as high as 98%. Moreover, the Estonian government claims that the paperless approach and the absence of queues has allowed for savings amounting to 2% of GDP.

Slovakia has been struggling with the implementation of a single access point and fails to provide a user-friendly interface that would enhance using e-services on a broader scale, while in the Czech Republic, only 15% of internet users actively engage in the use of eGovernment services. A European-wide comparison of use of digital services in the private sector vs. eGovernment points to a supply problem; we doubt that this would be a matter of financial resources. The European Union recognizes the need for effective and well-functioning eGovernment and supports these initiatives via EU funds. In its eGovernment Action Plan for 2016-20, the European Commission sets priorities focusing on facilitating digital interactions, with user-friendly interfaces available on mobile devices.

We do not think that the underdeveloped status of eGovernment in most CEE states is attributable to a lack of programming skills in the region, as countries can hire domestic or international companies to do the job. Usually, it is a lack of transparency in public procurement and its bad reputation that keeps many serious IT players out of this business, while exclusivity often makes it difficult to change the vendor; this, in turn, complicates enforcing discipline, and instead allows rent-seeking. We see the lag in eGovernment as a problem in both governance and strategy. In contrast to Estonia, we have seen a lack of a common strategy that would lead to the creation of a common platform to enable the secure exchange of information between decentralized systems.

Looking at the DESI scores, besides the huge opportunity that lies behind increasing the use of eGovernment, other areas might also be improved. The integration of Digital Technology is relatively low in Hungary, Poland and Romania, according to DESI. Looking at evidence from Eurostat, CEE lags behind in enterprises using ICT technology in their operations. For example, corporate resource planning with ERP (enterprise resource planning) software is below the EU average in all CEE countries.

Enterprises that share information between functional areas with ERP (percent of companies that employ 10 or more and have computers, w/o financial sector)



Source: Eurostat

Box 3: CEE mobile apps:

In each of the CEE countries, locally developed apps can be found among the top 50 most frequently downloaded apps in both the Google Play store and the Apple App Store. These highly-ranked apps are mainly region-specific bank apps, online shops and news apps. The medical app Zachranka, which is distributed in the Czech Republic and has been downloaded ca. 500,000 times, provides an interesting example: it allows users to quickly get in contact with emergency services, sending these services the exact location of the app's user. In Poland, the most popular apps are regional mobile banking apps with up to 5 million downloads. One Estonian app that has been downloaded nearly 500,000 times is an element of the eGovernment system, allowing the user to safely log into a secure site (e.g. bank account). The broad scope and popularity of locally-produced apps provides further evidence that the required level of skills exists in the countries of the region.

	Google Play Store		Apple App Store	
	Name	Type	Name	Type
Croatia	Pogodi Clash	news	Timber Tennis	games
			letgo	shopping
Czech Republic	seznam.cz	news	Jízdní řády	transport
	mapy.cz	transport	iRadar CZ+	news
	Jízdní řády	transport	mapy.cz	transport
	ct sport	news	stream.cz	entertainment
	Zachranka	medical	Aladin	news
Hungary	Jofogas	shopping	BKK FUTAR	transport
	Szokereso	games	Jofogas	shopping
	Idokep	news	Timber Tennis	games
	Topjoy napi	games		
	Honfoglalo	games		
Poland	olx	shopping	olx	shopping
	allegro	shopping	jakdojade	transport
	gg	communication	yanosik	transport
	Mbank	banking	veturilo	news
	iko	banking	iko	banking
Romania	olx.ro	shopping	olx.ro	shopping
			Triviadora Ro	games
Slovakia	Bazos	shopping	letgo	shopping
	Tatra Banka	banking	co ja viem	games
	pokec.sk	communication	Bazos	shopping
	co ja viem	games	Tatra Banka	banking
	Slovenske televizie	entertainment	Cestovne poriadky	transport
Slovenia	Ugani 5	games	Ugani 5	games
	AMZS	transport	drzi ne drzi?	games
	drzi - ne drzi?	games	letgo	shopping
	Moj Hot Slovenija	communication	moj a1	communication
			Timber Tennis	games
Estonia	Smart id	authentification	Smart id	authentification
	Swedbank	banking	Swedbank	banking
			Klubilaks	entertainment

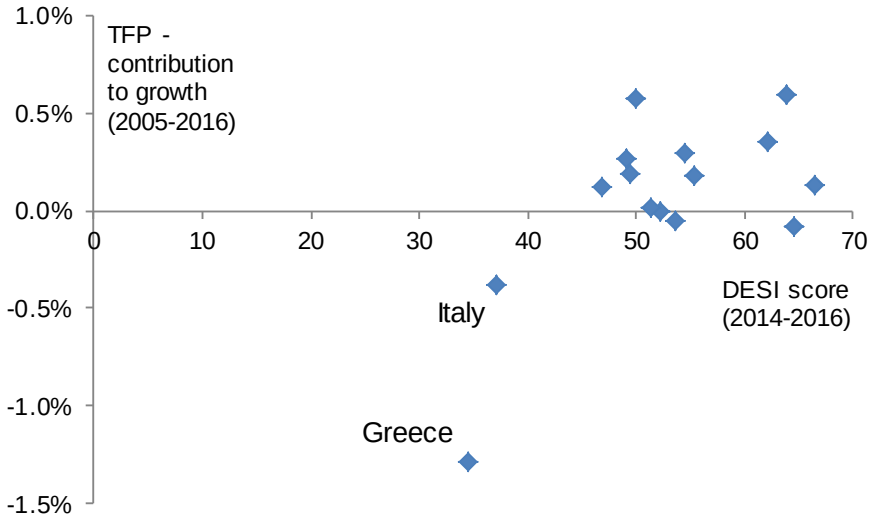
Source: SimilarWeb, Google Play Store, Apple App Store

Of course, investing in human capital, developing highly-skilled workers who are able to use advanced technologies (instead of focusing primarily on manufacturing jobs) is also something that should be fostered, as DESI shows some lag in CEE in digital skills (especially in Romania, but to some extent in Croatia, Hungary and Poland as well).

The key question is, can CEE speed up economic convergence by going digital more aggressively and by better utilizing digital infrastructure? Intuitively, we would certainly think so, although the strong positive correlation between a country's GDP per capita and its DESI score says nothing about causality. Thus, the question whether being more digital leads to stronger growth or if wealthier countries can simply afford to be more digital remains open.

Economic convergence does not happen from one day to the next. Yet, the comparison of the average DESI score between 2014-2016 and the average growth of total factor productivity between 2005-2016 in the Euro Area show that countries that have achieved a better economic development tend to now be scoring much better on digitalisation as well. Even with the limitations on stating the causal effect, we tend to think that, in the longer term, digitalisation could foster the development of growth positive factors. This is especially important currently for CEE, where increasing input costs challenge the previous growth engine, while demographic developments are also facing a strong headwind. Going digital seems to be a must in order to maintain an affordable pace of economic convergence.

TFP contribution in 2005-2016 vs DESI average score in 2014-2016, Euro Area countries[2]

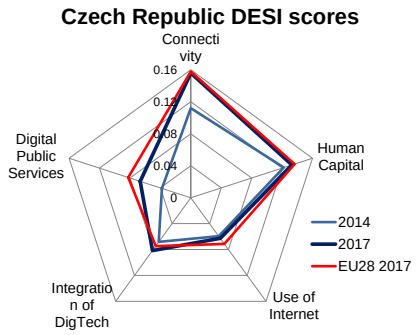


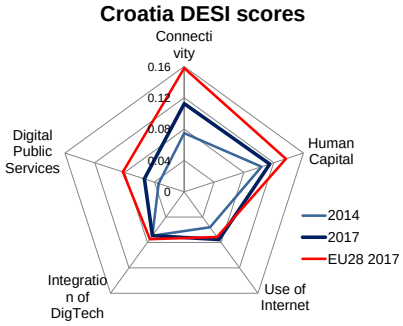
Source: European Commission, AMECO, Erste Group Research

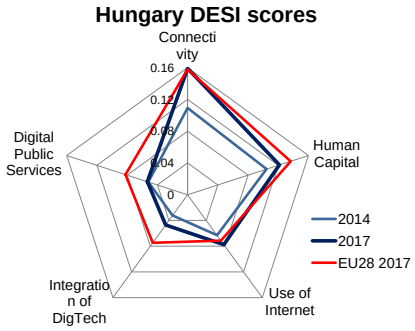
[2] Data on the level of digitalisation is not available for longer time horizons. Comparing comprehensive digital scores is only possible for the last few years and growth in such a short time period could also be distorted by different cyclical developments, which can be rather significant if we do not include the full economic cycle. Including CEE countries in the same time horizon could also be misleading, given their fast convergence before the crisis, which happened at a much lower level of digitalisation in the economy.

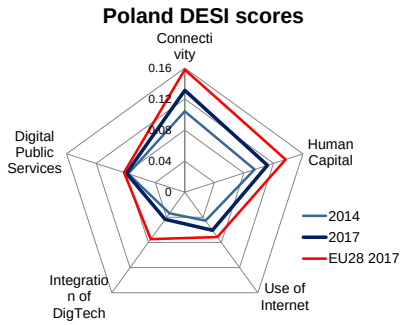
Appendix

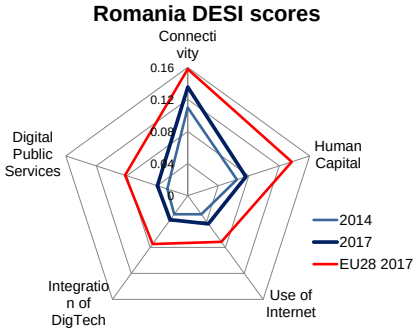
Digital Economy and Society Index (DESI) in individual CEE countries, vs EU average

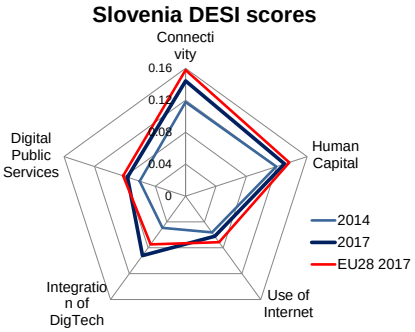


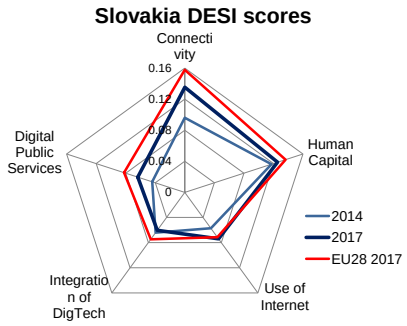












Source: European Commission

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