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OBSAH

ZHODNOCENÍ VÝVOJE MÍSTNÍHO KOEFICIENTU U DANĚ Z NEMOVITÝCH VĚCÍ V OBDOBÍ 2023-2025

EVALUATION OF THE DEVELOPMENT OF THE LOCAL COEFFICIENT FOR THE REAL ESTATE TAX IN THE PERIOD 2023–2025

Eliška Chuchlíková, Pavel Semerád

Abstrakt: *Článek se věnuje tomu, jak obce s více než 25.000 obyvateli reagovaly na zavádění a upravování místních koeficientů ve zdaňovacích obdobích 2023-2025. Cílem bylo zjistit, (i) jak obce využívaly místní koeficient v roce 2024 v porovnání s rokem 2023 a (ii) zda došlo i k meziročním změnám v letech 2024 a 2025. Výsledky ukazují, že obce volily cílenou strategii. Vyšší daňové zatížení bylo uplatněno u nemovitostí s podnikatelským a rekreačním využitím, zatímco obytné nemovitosti a zemědělské pozemky byly daňově zatížené méně. K největším změnám došlo mezi lety 2024 a 2025, kdy více než 60 % vybraných obcí přistoupilo ke změně výše místního koeficientu.*

Klíčová slova: *daň z nemovitých věcí, daňové zatížení, fiskální politika obcí, místní koeficient, obec.*

Abstract: *This article analyzes the institutional responses of municipalities with populations exceeding 25,000 to the implementation and adjustment of local coefficients during the 2023–2025 fiscal periods. The objective was to determine (i) how municipalities utilized local coefficients in 2024 compared to 2023 and (ii) whether further year-on-year changes occurred between 2024 and 2025. The results demonstrate that municipalities adopted a targeted strategy: a higher tax burden was applied to commercial and recreational properties, while residential buildings and agricultural land were subject to lower taxation. The most significant shifts took place between 2024 and 2025, when more than 60% of the selected municipalities opted to modify their local coefficient rates.*

Keywords: *Real Estate Tax, Tax burden, Municipal fiscal policy, local coefficient, municipality.*

JEL klasifikace*: H21, H71.*

1 ÚVOD

Daň z nemovitých věcí (dříve daň z nemovitosti) představuje stabilní součást daňové soustavy České republiky a představuje pro obce pravidelný a předvídatelný příjem, který je podle zákona o rozpočtovém určení daní výlučně jejich rozpočtovým zdrojem (Míča et al., 2024). Díky zákonné možnosti stanovit různé koeficienty mají obce částečnou daňovou pravomoc a mohou tak ovlivňovat výši daně podle místních podmínek. Tento prvek posiluje nástrojový význam daně v rámci samosprávy. Přesto analýzy ukazují (Kukalová et al, 2022), že většina obcí potenciál těchto koeficientů nevyužívala, čímž zůstávala část fiskálních možností neaktivní.

Tento postoj obcí zůstával neměnný až do roku 2024, kdy vlivem konsolidačního balíčku došlo k úpravám v oblasti rozpočtového určení daně. Dle původního návrhu mělo navýšení daně z nemovitých věcí plynout do státního rozpočtu (Česká televize, 2023; Pál a Radvan, 2025). Tato skutečnost vyvolala nevoli např. u Svazu měst a obcí České republiky (2023). Na základě připomínek obcí, došlo k ponechání daňového příjmů z nemovitých věcí obcím, avšak došlo ke snížení výnosů z daně z příjmů a daně z přidané hodnoty.

Výsledkem bylo meziroční navýšení základních sazeb daně (2023/2024) o 80 % (Ministerstvo financí České republiky, 2023). Současně byl zaveden inflační koeficient, který umožňuje každoroční úpravu daně podle vývoje inflace. Tím je zajištěna dlouhodobá potřeba pravidelného přizpůsobování výše daně v závislosti na ekonomické realitě. Pro zdaňovací období let 2024-2026 je inflační koeficient 1,0 (Ministerstvo financí České republiky, 2025).

Daň z nemovitých věcí je součástí přímých daní v České republice. Její legislativní úprava je zakotvena v zákoně č. 338/1992 Sb., o dani z nemovitých věcí. Tato daň je rozdělená na daň z pozemku, ze staveb a jednotek. Způsob a výše jejich zdanění závisí na tom, jak jsou tyto předměty zdanění uvedeny v katastru nemovitostí. Některé z nich mohou být i při splnění zákonných podmínek osvobozeny, jiné mohou být ze zdanění zcela vyjmuty (nejsou předmětem daně).

Základ daně z pozemků představuje předmět daně vyjádřený v konkrétních měrných jednotkách. U valorických daní je stanoven v peněžních jednotkách, zatímco u specifických daní se určuje v nepeněžních jednotkách (Koubovský, 2022). V případě daně z pozemků se využívají oba tyto přístupy. U některých pozemků se základ daně stanovuje na základě jejich hodnoty vyjádřené peněžně (Kč), zatímco u jiných se odvíjí od jejich výměry (m^2).

V závislosti na druhu pozemku jsou uplatňovány sazby buď v procentuální výši, nebo ve výši Kč na m^2. Specifikum je následně u stavebních pozemků, kde se sazba dále násobí koeficientem stanoveným dle počtu obyvatel (ke dni posledního sčítání lidu).

Pro pozemky, stavby a jednotky platí, že obec může využít místní koeficient. Výpočet pak vypadá tak, jak je uvedeno v *Rovnici 1*.

$Da\check{n} = ZD \times (ZS \times K_{PO}) \times K_M \times K_I$, kde (*1*)

Daň z pozemků nebo ze staveb a jednotek,

ZD základ daně,

ZS sazba daně

K_{PO} koeficient dle počtu obyvatel (pouze u vybraných nemovitých věcí),

$\mathrm{K_M}$ koeficient místní,

K_I inflační koeficient.

Základ daně u staveb a jednotek vychází z výměr podlahové (jednotky) nebo zastavěné plochy (stavby). V případě jednotek se ještě tato výměra násobí koeficientem 1,20 nebo 1,22 v závislosti na tom, zda má vlastník nemovité věci i spoluvlastnický podíl na pozemku. Základ daně se pak odvíjí způsobu využívání nemovité věci.

Platí však, že je základní sazba platná pouze pro první nadzemní podlaží. V případě dalších nadzemních podlaží je připočítáváno ještě 1,40 Kč/m^2. Drobné odlišnosti jsou v případě velikosti dalších nadzemních podlaží u rezidenčních staveb a ostatních staveb např. určených pro podnikání, ale princip je zachován u každé z nich.

Zásadním rozdílem však je, že se u rezidenčních staveb a jednotek uplatňuje ještě koeficient stanovený dle počtu obyvatel. Součin základu daně a sazby daně může být navýšen o místní koeficient stanovený obcí a od roku 2024 je také kalkulován inflační koeficient.

Veškeré daňové povinnosti se odvíjí od stavu k 1. ledna zdaňovacího období. Daňové přiznání je v případě změny podáváno do 31. ledna a termín platby daně je 31. května (u daňové povinnosti nižší než 5.000 Kč), nebo 31. srpna (zemědělci) a 30. listopadu (v případě dvou stejných splátek) zdaňovacího období.

Pokud ke změně např. v případě vlastnictví nebo způsobu užití nemovité věci od minulého zdaňovacího období nedošlo, není nutné podávat daňové přiznání a správce daně odešle předpis pro zaplacení daně daňovému subjektu automaticky. Tento předpis již obsahuje i změny, které schválí obec v podobě místního koeficientu. Pro daňové subjekty je to výrazné administrativní ulehčení práce s podáním přiznání.

2 CÍL A METODIKA

Cílem článku je zhodnotit, jak obce reagovaly na novelu při zavádění a upravování místních koeficientů pro celé území obce, pro jednotlivé části obcí, pro konkrétní katastrální území a pro skupiny nemovitých věcí v průběhu zdaňovacích období let 2023 až 2025. Zvláštní pozornost jsme věnovali zvýšením a snížením, neboť jak vyplývá z veřejně dostupných zdrojů, některé obce musely před občany obhajovat uplatnění místního koeficientu a některé pod vlivem veřejné kritiky koeficient buď snížily nebo zcela zrušily (např. Petrášová, 2025; Statutární město Zlín, 2024b). Byla použita metoda komparace právního stavu před novelou (zdaňovací období 2023) a dvou následujících období v průběhu účinnosti novely (2024 a 2025). Novela je účinná od 1. ledna 2024.

Před tím, než uvedeme metodický postup našeho výzkumu, je nutné s ohledem na akademickou etiku výzkumu zmínit, že úvodní část, teoretická a praktická část a závěry vychází, nebo jsou zcela převzaty z obhájené bakalářské práce na Vysoké škole Sting s názvem *Zhodnocení novely zákona o dani z nemovitých věcí* (Chuchlíková, 2025). V jednotlivých převzatých pasážích jsou zachovány citace použitých zdrojů a seznam použité literatury je součástí tohoto článku.

Výběr obcí z celého souboru byl v našem výzkumu založen na tom, které z nich zavedly, upravily nebo zrušily ve sledovaném období místní koeficient daně z nemovitých věcí.

Data byla získána a zkompletována na základě dvou žádostí podaných podle zákona č. 106/1999 Sb., o svobodném přístupu k informacím na Generální finanční ředitelstvím (GFŘ). První žádost byla podána dne 17. listopadu 2024 a týkala se seznamu obcí, které uplatňovaly či uplatňují místní koeficient v letech 2023 až 2025. V reakci na tuto žádost jsme získali seznamy za roky 2023 a 2024. Pro rok 2025 ještě tento seznam nebyl dostupný z důvodu dosud neuplynulé lhůty pro podání přiznání k dani z nemovitých věcí.

Druhou žádost jsme proto podali 13. února 2025 a v zákonné lhůtě jsme obdrželi seznam obcí a koeficientů ve zdaňovacím období roku 2025. Díky tomu jsme byli schopni vytvořit jeden společný dokument a porovnat v něm meziroční změny 2023/2024 a 2024/2025.

V České republice je 6.258 obcí (Český statistický úřad, 2024), proto jsme vzhledem k tomuto velkému množství zúžili vzorek na obce, které mají více než 25.000 obyvatel. Takto stanovená hranice byla inspirována zákonem o dani z nemovitých věci. U takto velkých obcí dle počtu obyvatel se základ daně u stavebních pozemků, obytných domů, budov a jednotek násobí koeficientem 2,5 a vyšším.

3 VÝSLEDKY

Na základě poskytnutých dat od Generálního finančního ředitelství vyplývá, že z celkového množství obcí v České republice uplatnilo ve sledovaném období 2023-2025 místní koeficient následujícím způsobem:

- 1.154 obcí na celém svém území,
- 147 obcí pouze pro určité části obce,
- v 591 případech byl místní koeficient uplatněn na úrovni jednotlivých katastrálních území,
- 1.086 obcí využilo možnosti zavedení místního koeficientu pro skupiny nemovitostí (rok 2025).

V rámci našeho vzorku obcí s vyšším počtem než 25.000 obyvatel byly výsledky následující:

- 35 obcí mělo místní koeficient zavedený plošně pro celé své území,
- 4 obce měly místní koeficient aplikován pouze na vybrané části,
- 4 katastrální území měla uplatněna místní koeficient,
- 45 obcí zavedlo v roce 2025 místní koeficient specificky pro vymezené skupiny nemovitých věcí (podrobněji viz Chuchlíková, 2025).

Souhrnné výsledky jsou zapracovány do Tabulek 1-4, ze kterých je možné porovnat, (*i*) které obce již místní koeficient měly v roce 2023, (ii) které ho zavedly, příp. upravily v roce 2024 a (*iii*) které s ním dále pracovaly v roce 2025. Hodnota „0“ je převzata z dokumentů, které byly získány na základě žádostí od Generálního finančního ředitelství, a značí, že obce koeficient ve sledovaných letech neuplatnily.

Tabulka 1: Místní koeficienty 2023-2025 pro celé obce (vybraný vzorek obcí s více než 25.000 obyvateli).

Název obce	Číslo obce	Koeficient 2023	Koeficient 2024	Koeficient 2025
Česká Lípa	561380	2	2	0
Havířov	555088	2	2	1,8
Hradec Králové	569810	3	3	3
Cheb	554481	2	2	2
Chomutov	562971	2	2	2
Jablonec nad Nisou	563510	0	0	2
Jihlava	586846	0	1,5	1,5
Karlovy Vary	554961	2	2	2
Karviná	598917	2	2	2
Kolín	533165	2	2	2
Liberec	556904	2	2	2
Mladá Boleslav	535419	3	3	0
Most	567027	2	2	2
Olomouc	500496	2	2	2
Opava	555321	2	2	3
Orlová	599069	0	2	0
Písek	549240	0	1,4	1,4
Praha 2	500089	2	2	1,5
Praha 3	500097	2	2	1,5

Název obce	Číslo obce	Koeficient 2023	Koeficient 2024	Koeficient 2025
Praha 4	500119	2	2	1,5
Praha 5	500143	2	2	1,5
Praha 6	500178	2	2	1,5
Praha 7	500186	2	2	1,5
Praha 8	500208	2	2	1,5
Praha 9	500216	2	2	1,5
Praha 10	500224	2	2	1,5
Praha 11	547034	2	2	1,5
Praha 12	547107	2	2	1,5
Praha 13	539694	2	2	1,5
Praha 14	547361	2	2	1,5
Praha 15	547387	2	2	1,5
Příbram	539911	2	2	2
Tábor	552046	2	2	0
Ústí Nad Labem	567892	2	2	2
Znojmo	593711	2	2	0

Zdroj: Vlastní zpracování na základě dat od Generálního finančního ředitelství

Z Tabulky 1 je patrné, že většina obcí uplatňovala místní koeficient v roce 2023 a 2024 ve stejné výši. K jeho zavedení došlo v Jihlavě, Orlové a Písku. Jablonec nad Nisou zavedl koeficient až v roce 2025. Jihlava tento svůj krok odůvodnila tím, že během 14 let, kdy koeficient neuplatnila, došlo ke kumulativní inflaci o 60 % (Magistrát města Jihlavy, 2024). Orlová a Písek tímto způsobem zareagovaly na snížení příjmů v rámci rozpočtového určení ostatních daní (Městský úřad Orlová, 2024; Měšťanová, 2023).

Zajímavá je meziroční změna 2024/2025, kdy z 35 obcí, které měly zavedený místní koeficient, došlo ke jeho snížení ve 22 případech. K největší plošné změně došlo u městských částí Praha 2-15. Jiné obce (Česká Lípa, Mladá Boleslav, Orlová, Tábor a Znojmo) místními koeficienty zatížily jednotlivá katastrální území nebo jednotlivé skupiny nemovitých věcí (např. ČTK, 2024). Zdůvodnění byla téměř totožná. Obce nechtěly navyšovat daňovou zátěž na své obyvatele (Městský úřad Orlová, 2024; Morávek, 2024). Opačným směrem se vydal Jablonec nad Nisou, který koeficient zavedl, a Opava, která koeficient navýšila (Statutární město Opava, 2025).

Tabulka 2: Místní koeficienty 2023-2025 pro části obcí

Název obce	Číslo obce	Část obce	Koeficient 2023	Koeficient 2024	Koeficient 2025
Cheb	554481	Část obce 1	0	4	0
Cheb	554481	Část obce 2	0	3	0
Liberec	556904	Část obce 1	0	0	5
Moravská Ostrava a Přívoz	545911	Část obce 1	0	1,7	0
Ústí nad Labem	567892	Část obce 1	0	0	5

Zdroj: Vlastní zpracování na základě dat od Generálního finančního ředitelství

Z Tabulky 2 vyplývá, že v Chebu, Liberci, Moravské Ostravě a Přívozu a Ústí nad Labem byly místní koeficienty uplatněny odlišně; co do výše a načasování. Cheb (3, resp. 4) a Moravská Ostrava a Přívoz (1,7) uplatňovaly koeficient jen v roce 2024. Liberec a Ústí nad Labem skokově zavedly koeficient z 0 na 5 v roce 2025. Obce stejně jako v případě plošného zavedení (Tabulka 1) zdůvodňovaly tuto změnu jako navýšení příjmů pro zajištění obslužnosti daných lokalit (Statutární město Ústí nad Labem, 2024; Strohmaierová, 2023).

Tabulka 3: Místní koeficienty 2023-2025 pro jednotlivá katastrální území

Název KÚ	Číslo KÚ	Koeficient 2023	Koeficient 2024	Koeficient 2025
Česká Lípa	621382	0	0	2
Orlová	712361	0	0	1,3
Tábor	764701	0	0	2
Zlín	635561	0	2,9	2

Zdroj: Vlastní zpracování na základě dat od Generálního finančního ředitelství

Z Tabulky 3 vyplývá, že Orlová je jednou z obcí v České republice, která s místním koeficientem aktivně pracuje. Po zrušení koeficientu pro obce v roce 2024 byl v roce 2025 zaveden místní koeficient pro katastrální území (Městský úřad Orlová, 2024). Ke změně došlo také ve Zlíně, který nejprve místní koeficient zavedl ve výši 2,9 a v roce 2025 ho snížil na 2,0 (Statutární město Zlín, 2024a).

Problematika koeficientů je mnohem obsáhlejší. My jsme v rámci tohoto článku vycházeli z dat poskytnutých od Generálního finančního ředitelství. Obec ale také může *obecně závaznou vyhláškou koeficient podle odstavce 4* (koeficient dle počtu obyvatel, kterým se násobí základní sazba daně; pozn. autorů)[1] *zvýšit o jednu kategorii podle členění koeficientů pro všechny zdanitelné stavby zařazené ve skupině obytných budov a všechny zdanitelné jednotky zařazené ve skupině ostatních zdanitelných jednotek na území jednotlivého katastrálního území, jednotlivého městského obvodu nebo jednotlivé městské části. Koeficient 4,5 lze takto zvýšit na koeficient 5,0.* (§ 11, odst. 5, zákona o dani z nemovitých věcí)

Pro doplnění uvádíme, že např. obec Orlová uplatňovala v rámci jednotlivých katastrálních území (Lazy, Orlová, Poruba a Horní Lutyně) rozdílné koeficienty v rozpětí 1,4-2,5. Konkrétní hodnoty jsou uvedeny v Obecně závazné vyhlášce města Orlová o stanovení koeficientů pro výpočet daně z nemovitých věcí (účinnost od 1. 1. 2024), která je uložená ve Sbírce právních předpisů územních samosprávných celků a některých správních úřadů.

Tabulka 4: Četnost uplatnění místního koeficientu pro skupiny

Skupina	Počet obcí	Procentní vyjádření	Nejčastější hodnota
A, B, W	4	8,89 %	1
C	19	42,22 %	2
X	19	42,22 %	2
Y	23	51,11 %	2
F	7	15,56 %	2
Q	19	42,22 %	2
G	19	42,22 %	2
E	19	42,22 %	2
H, I	5	11,11 %	1
J, K	39	86,67 %	3
L, V	42	93,33 %	3
M, S	37	82,22 %	3
N, T	41	91,11 %	3
O, U	41	91,11 %	3
P	20	44,44 %	2
R, Z	5	11,11 %	1

Zdroj: Vlastní zpracování na základě dat od Generálního finančního ředitelství

[1] U pozemků se využívá obdobného ustanovení: *Obec může obecně závaznou vyhláškou koeficient podle odstavce 3 zvýšit o jednu kategorii podle členění koeficientů pro všechny pozemky podle odstavce 2 písm. c) na území jednotlivého katastrálního území nebo jednotlivého městského obvodu nebo jednotlivé městské části. Koeficient 4,5 lze takto zvýšit na koeficient 5,0.* (§ 6 odst. 4, zákona o dani z nemovitých věcí)

Z Tabulky 4 vyplývají následující zjištění:

- Mezi skupinami pozemků se nejčastěji uplatňoval místní koeficient ve skupině Y (ostatní zpevněné plochy pozemku), kde byl zaveden v 23 obcích, což odpovídá 51,11 % ze všech sledovaných obcí.
- Následují skupiny C (lesní pozemky), X (zemědělské zpevněné plochy pozemku), Q (jiné plochy), G (vybrané ostatní plochy) a E (zastavěné plochy a nádvoří), všechny se shodným zastoupením 42,22 % (19 obcí).
- Skupina F (stavební pozemky) byla upravena v 7 obcích (15,56 % z celkového počtu sledovaných obcí).
- Naopak nejméně zastoupeny byly skupiny A (vybrané zemědělské pozemky), B (trvalé travní porosty) a W (nevyužitelné ostatní plochy), ve všech třech případech se jednalo o 4 obce (pouze 8,89 %).
- U většiny těchto skupin se jako nejčastější hodnota místního koeficientu objevuje hodnota 2, s výjimkou skupin A, B a W, kde převládá koeficient 1.

Ve skupině staveb a jednotek byl místní koeficient nejčastěji aplikován:

- ve skupině L, V (garáže), kde se objevil v 42 obcích (93,33 % celkového vzorku),
- skupiny N, T (stavby a jednotky pro podnikání v průmyslu, stavebnictví, dopravě a energetice) a O, U (stavby a jednotky pro ostatní druhy podnikání) byly zastoupeny v 91,11 % případech (41 obcí),
- zdanění podnikání v zemědělství, lesním a vodním hospodářství (M, S) bylo upraveno ve 37 obcích (82,22 %),
- skupiny J, K (rekreační budovy) byly zastoupeny v 39 obcích (86,67 %),
- skupina P (ostatní zdanitelné stavby) ve 20 obcích (44,44 %),
- nejnižší zastoupení měly skupiny H, I (obytné budovy) a R, Z (ostatní zdanitelné jednotky) s výskytem v 5 obcích (11,11 %).

U většiny skupin staveb a jednotek převažuje jako nejčastěji aplikovaná hodnota koeficientu 3, s výjimkou skupin H, I a R, Z, kde převažuje koeficient 1, a skupiny P, kde je nejčastější koeficient 2.

4 DISKUSE A ZÁVĚRY

Cílem článku je zhodnotit, jak obce reagovaly na novelu při zavádění a upravování místních koeficientů pro celé území obce, pro jednotlivé části obcí, pro konkrétní katastrální území a pro skupiny nemovitých věcí v průběhu zdaňovacích období let 2023 až 2025. Konkrétně jsme se zaměřili na obce s více než 25.000 obyvateli.

Naše výsledky vycházely z hodnocení souhrnných dat, která jsme získali na základě dvou samostatných žádostí dle zákona o svobodném přístupu k informacím od Generálního finančního ředitelstvím České republiky. Výsledky ukazují, že výraznější proměny nastaly až mezi roky 2024 a 2025, kdy více než 60 % sledovaných obcí přistoupilo ke změně výše místního koeficientu. Zatímco v roce 2024 uplatnilo koeficient 2,0 celkem 30 obcí, v roce 2025 jej zachovalo pouze 12 obcí.

Nejčastěji se jednalo o snížení v souvislosti s úpravou základního koeficientu (například u městských částí Prahy, kde došlo ke snížení z hodnoty 2,0 na 1,5), případně o jeho odstranění tam, kde obce nově využily možnost zavést různé koeficienty pro skupiny nemovitostí. Například v Orlové, Znojmě, Mladé Boleslavi, České Lípě či Táboře, kde byl koeficient v roce 2024 stanoven na 2,0.

V některých městech naopak došlo k navýšení koeficientu nebo k jeho novému zavedení tam, kde to odpovídalo rozpočtovým potřebám obce – například v Opavě, kde byl koeficient zvýšen z 2,0 na 3,0 nebo v Jablonci nad Nisou, kde byl nově zaveden s hodnotou 2,0.

Jedním z nejvýznamnějších dopadů novely se stalo široké využití nové možnosti cíleného zdanění prostřednictvím místních koeficientů pro skupiny nemovitostí. Analýza ukázala, že obce s více než 25.000 obyvateli, které byly v rámci tohoto článku sledovány, velmi aktivně reagovaly na tento legislativní nástroj a začaly jej využívat k promyšlenému ovlivnění daňové zátěže různých typů nemovitostí.

V roce 2025 byly místní koeficienty nejčastěji zaváděny u skupin garáží (L, V), kde je stanovilo 93,33 % sledovaných obcí. Výrazné uplatnění měly také u staveb a jednotek pro podnikání v průmyslu, stavebnictví, dopravě a energetice (N, T), a u ostatních druhů podnikání (O, U), kde je zavedlo shodně 91,11 % obcí. Rekreační stavby (J, K) byly zatíženy koeficientem v 86,67 % případů a nemovitosti využívané pro zemědělství, lesní a vodní hospodářství (M, S) v 82,22 % sledovaných měst.

Naopak u obytných budov (H, I) byly koeficienty zavedeny jen v 11,11 % případů, u stavebních pozemků (F) v 15,56 %, u zemědělských pozemků (A, B, W) v 8,89 % a u ostatních zdanitelných jednotek (R, Z) v 11,11 %.

Tyto výsledky ukazují, že obce volily cílenou strategii, kdy vyšší daňové zatížení uplatňovaly především u nemovitostí s podnikatelským nebo rekreačním využitím, zatímco obytné nemovitosti a zemědělské pozemky byly zdaněny méně. Tento přístup odpovídá snaze o udržení sociální únosnosti daně při současném zajištění stabilních příjmů pro rozpočet obce. Přístup jednotlivých obcí ke strategii zavádění koeficientů se však výrazně lišil. Zatímco některá města (například Praha) volí jednotné nastavení koeficientů napříč městskými částmi a skupinami nemovitostí, jiná (například Mladá Boleslav, Trutnov) využívají vysokou variabilitu v nastavení s cílem zohlednit specifika svého území a daňové politiky.

Výsledky rovněž potvrdily, že zavedení možnosti cíleného zdanění pomohlo obcím reagovat na dopady vládního konsolidačního balíčku, který vedl ke snížení některých jiných daňových příjmů. Místní koeficienty se tak staly účinným nástrojem pro stabilizaci městských rozpočtů.

Důležitým zjištěním je také to, že místní koeficienty nejsou nástrojem, který by obce jednorázově nastavily a ponechaly beze změny. Naopak je patrné, že samosprávy s tímto nástrojem aktivně pracují a průběžně jej přizpůsobují aktuálním potřebám, ekonomické situaci i zpětné vazbě obyvatelstva. Cílem je přitom nacházet vyváženou úroveň daňového zatížení, která podpoří stabilitu příjmů obcí a zároveň nebude nadměrnou zátěží pro poplatníky.

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COMPARATIVE STUDY OF STOCK VALUATIONS USING SHILLER'S P/E: FROM DOTCOM TO ARTIFICIAL INTELLIGENCE FINANCIAL BUBBLES

Sandra Matušovičová

Abstract: *Following the release of ChatGPT in 2022, artificial intelligence (AI) has become a major investment trend, with NVIDIA rising to the position of the world's most valuable company and prompting frequent comparisons to the Dotcom internet bubble. This paper aims to compare valuations during these two technological booms by employing Shiller's price-to-earnings (P/E) ratio alongside performance indicators, such as total return and compound annual growth rate (CAGR). Our results indicate that while both periods exhibit signs of overvaluation, the Dotcom bubble was considerably more extreme, as evidenced by both higher historical returns and peak P/E ratios. AI valuations, though elevated, seem to for now be supported by stronger earnings growth. This research contributes to existing literature by providing data-driven comparisons between the Dotcom and AI booms, offering novel retrospective insights into sustainability of current AI valuations and associated bubble risks.*

Keywords: *artificial intelligence bubble, dotcom bubble, stock market, technology stocks, investment valuation*

JEL classifications: *G12*

1 INTRODUCTION

Artificial Intelligence (AI) undoubtedly holds the position of one of the most significant investment trends of the 21st century. In 2024, global private investment in generative AI reached $33.9 billion, marking an 18.7% increase from the previous year and over 8.5 times higher than the 2022 levels (Stanford, 2025). This surge in investment has been accompanied by remarkable corporate valuations. Notably, NVIDIA's market capitalization soared to $4 trillion in July 2025, surpassing that of industry giants like

Microsoft and Apple (Reuters, 2025). Such rapid growth has naturally led financial experts to draw parallels between the current AI boom and historical technology bubbles, most frequently the Dotcom bubble of the late 1990s and early 2000s (J.P. Morgan, 2024; Morningstar, 2025; Floridi, 2024).

The primary aim of this paper is to quantitatively compare the valuation metrics of today's AI boom with those of the Dotcom period. After its collapse in 2000, the Dotcom episode was retrospectively identified as a speculative financial bubble by several empirical and econometric studies (e.g. Ofek & Richardson, 2003; Phillips, Shi, & Yu, 2011). By employing Shiller's Price-to-Earnings (PE) ratio (2001), alongside with graphical analysis and various performance indicators, our research seeks to assess whether the current AI market exhibits signs of overvaluation akin to those observed during the well-known internet era.

The research has in this regard the potential to contribute to the currently limited body of literature on the emerging phenomenon of the AI bubble, as few academic studies have yet addressed it in a more structured, empirical way. This paper thus advances the discussion by examining valuation dynamics at both the aggregate market level — through the NASDAQ stock index — and the firm level, comparing leading technology companies across two distinct periods (the Dotcom "Four Horsemen" and the AI-era "Magnificent Seven"). Moreover, by employing Shiller's P/E ratio as a central analytical tool, the study utilizes an objective and historically comparable metric for assessing valuation intensity. This methodological approach enriches both the theoretical understanding of speculative technology-driven bubbles, while simultaneously providing novel empirical evidence relevant to the ongoing debate on whether the current AI boom truly represents a sustainable growth trend or the early stages of a new financial bubble.

2 LITERATURE REVIEW

2.1 Stock valuation and financial bubbles theories

Stock valuation is the cornerstone of understanding whether asset prices reflect intrinsic values or speculative deviations. In finance, intrinsic value is commonly defined as the present value of all expected future cash flows generated by an asset (Aspers & Beckert, 2011). For equities, this can be proxied through discounting dividends or earnings, while for non-yielding assets such as gold or real estate, valuation often relies on alternative measures such as production costs or rental yields (Shiller, 2007).

When asset prices significantly exceed intrinsic value, they may enter the territory of a financial bubble. Although no universally accepted definition of financial bubbles exists, most accounts converge on the notion of prices being driven away from fundamentals by speculation and investor sentiment. Notably, Charles Kindleberger (2005) in his publication *Manias, Panics, and Crashes* described bubbles as periods when asset prices rise sharply due to speculative enthusiasm rather than fundamental factors, often progressing through stages such as displacement, boom, euphoria, crisis, and eventual burst or revulsion. Keynes (1936) earlier emphasized the role of demand-driven disequilibrium, while Blanchard and Watson (1982) highlighted the speculative motive to sell overvalued assets at even higher prices.

Subsequent literature further refined these views. Stiglitz (1990) conceptualized bubbles as cycles of rapid price escalation followed by abrupt correction, while Garber (2000) underscored their behavioral dimension during the then ongoing Dotcom boom. Abreu and Brunnermeier (2003) distinguished between rational bubbles, where investors knowingly buy overvalued assets expecting resale profits, and irrational bubbles, which stem from purely behavioral biases and limits to arbitrage. Robert J. Shiller, a Nobel Prize laureate in Economic Sciences from 2013, in his breakthrough book from 2000 characterized bubbles as driven by so-called “irrational exuberance,” a form of contagious investor psychology that magnifies price surges through stories of success and speculative fervor. More recent literature like Greenwood, Shleifer, and You (2019) or Li et al. (2022) continues to explore these foundations of asset overvaluation, linking media news coverage, online buzzwords and market sentiment to speculative cycles.

From an empirical perspective, valuation ratios are frequently used to identify periods of potential overvaluation. Among these, the price-to-earnings ratio (P/E) and its cyclically adjusted version popularized by already referenced Robert Shiller (CAPE or Shiller’s P/E) remain central. The P/E ratio captures how much investors are willing to pay relative to company’s earnings — when it rises far above historical or fundamental benchmarks, it typically signals that assets are overvalued and expectations may be unsustainably high. Shiller (2001) demonstrated that abnormally high P/E levels often precede corrections, making them going forward a key tool for studying speculative excess in equity markets.

2.2 Technological bubbles and the Dotcom internet bubble

Technological bubbles are distinct from other financial bubbles in that they are often fueled by breakthrough innovations perceived to hold extraordinary future profitability (Malkiel, 2015). The potential for disruptive technologies to reshape entire industries amplifies speculative enthusiasm, as investors are willing to pay premiums for uncertain but revolutionary growth prospects (Kindleberger et al., 2005; Lansing, 2009).

The Dotcom bubble of the late 1990s and early 2000s represents a paradigmatic example. Following the advent of the World Wide Web and milestones such as Netscape's 1995 IPO, which soared from USD 28 to USD 75 in a single day (Cassidy, 2002), investors flocked to internet and telecommunications firms. By 1999, nearly 500 technology IPOs had taken place (Shiller, 2000), many raising millions of dollars despite lacking viable business models. This enthusiasm was reinforced by easy monetary conditions and capital availability in the U.S. and Japan (Ofek & Richardson, 2003).

Valuations reached unsustainable heights, with the NASDAQ index quintupling from 1995 to 2000, peaking at over 5,000 points before collapsing (Valliere & Peterson, 2004). The crash was triggered by rising U.S. interest rates, concerns about non-profitable firms, and broader global economic uncertainty (DeLong & Magin, 2006). Within two years, the NASDAQ lost nearly 80% of its value, erasing trillions in market capitalization and leaving a lasting mark on the financial history of speculative manias (Sornette, 2003).

2.3 Characteristics of the current potential AI stock bubble

The most recent candidate for a technological bubble is linked to artificial intelligence (AI). The surge of interest in generative AI, particularly after the public release of ChatGPT in November 2022, sparked widespread enthusiasm about AI's transformative potential across industries (Floridi, 2024). This momentum has been reinforced by the so-called "Magnificent 7" — seven American technological companies Apple, Microsoft, Nvidia, Amazon, Meta, Alphabet, and Tesla — whose innovations and AI integration strategies positioned them at the forefront of global markets (Cecconi, 2023; Basu, 2025; Sonnenfeld & Henriques, 2025). Collectively, these firms reached multi-trillion-dollar valuations, with NVIDIA in particular experiencing explosive stock price growth due to its dominant role in supplying GPUs essential for AI model training (The Economist, 2023).

Several factors underpin the rapid rise of AI-related valuations. First, the COVID-19 pandemic accelerated digital transformation, heightening demand for AI solutions in automation, efficiency, and remote work (PwC, 2021). Second, ChatGPT's success demonstrated tangible AI capabilities to the public and investors, intensifying narratives of revolutionary change. Third, NVIDIA's dominance in AI hardware positioned it as a critical supplier, leading to sharp increases in its market capitalization. Finally, investor sentiment and speculation play a central role, with capital inflows driven by a desire to participate in the AI boom despite yet uncertain profitability horizons (Newall & Weiss-Cohen, 2022). Recent evidence underscores this dynamic with Arnott, Commins, and Liu (2025) identifying the extraordinary post-2022 performance of the "Magnificent 7" as a key driver of the current market exuberance, while Karoui et al. (2024) argue that such AI-led outperformance reflects an increasingly asymmetric and potentially unsustainable valuation levels. Together, these studies suggest that the market is entering a high-returns phase characteristic of early-stage technological bubbles, where future innovation is rapidly capitalized into prices, often beyond what fundamentals can support.

This confluence of technological promise and speculative fervor indeed mirrors the earlier patterns observed in the Dotcom era. A widening academic discussion, such as Floridi (2024), have likewise identified the rapid appreciation of AI-related equities as indicative of a potential technological bubble, drawing direct parallels to the already described dynamics of the Dotcom period. Whether AI represents a true economic transformation or a financial bubble therefore remains an open question — one that valuation metrics such as formerly mentioned Shiller's P/E are well-suited to help further explore.

3 METHODOLOGY OF THE RESEARCH

The methodology for this particular paper is based mainly on a quantitative approach that allows for a comprehensive assessment of potential overvaluation in technology stocks during the two key periods of market euphoria — the Dotcom bubble and the current AI-driven stock boom. By applying scientific methods of analysis, deduction, synthesis and comparison, the study aims to systematically evaluate whether the current market shows similar characteristics of speculative excess as the one previously observed at the turn of the millennium.

Empirical part of the research utilizes cross-sectional data capturing multiple firms in two distinct years that represent the respective technological boom: the year 2000 for the peak of the Dotcom bubble and 2025 for the ongoing AI stock surge. The analysis focuses on the leading companies that were central to each bubble episode. For the Dotcom period, these include Cisco Systems (CSCO), Dell (DELL), Intel (INTC), and Microsoft (MSFT), commonly referred to as the "Four Horsemen of Tech". For the current AI-driven market, the analysis covers the "Magnificent 7" companies, specifically Apple (APPL), Microsoft (MSFT), NVIDIA (NVDA), Amazon (AMZN), Meta (META), Alphabet (GOOG) and Tesla (TSLA).

All financial data were sourced primarily from Yahoo Finance and Bloomberg, supplemented where necessary by official company financial statements. The key variables under consideration are annual stock prices and annual earnings, which together allow for the calculation of both profitability and valuation indicators. These indicators include the Total return, Compound Annual Growth Rate (CAGR), and the Price-to-Earnings (P/E) ratio, defined by the following formulas 1 and 2:

$$\boldsymbol{Total\ return} = \frac{Total\ gain\ from\ investment}{Initial\ investment} \times 100 \tag{1}$$

$$\boldsymbol{CAGR} = \left(\left(\frac{Final\ Value}{Initial\ Value} \right)^{\frac{1}{n}} - 1 \right) \times 100 \tag{2}$$

Total return measures the overall profitability of an investment, capturing both capital gains and dividends relative to the initially invested value. Second, the Compound Annual Growth Rate (CAGR) reflects the average annual rate of growth of an investment over a multi-year period, providing a smoothed measure of performance.

$$\boldsymbol{P/E\ ratio} = \frac{Market\ price\ per\ share}{Earnings\ per\ share} \tag{3}$$

$$\boldsymbol{CAPE} = \frac{Current\ \ price\ per\ share}{10{-}year\ average\ of\ EPS} \tag{4}$$

The aforementioned P/E ratio (shown above in formula 3), popularized also in its cyclically adjusted form (CAPE) (formula 4), by Nobel laureate Robert J. Shiller, is used as the central valuation metric due to its ability to capture investor expectations relative to underlying earnings. Previous empirical research has shown that when the P/E or CAPE rises substantially above long-term historical averages, it often signals potential overvaluation. Historically, Shiller (2000, 2001) observed that for U.S. equities, a cyclically adjusted P/E above approximately 15–25 (depending on sector) has frequently preceded periods of significant market corrections. Subsequent studies confirm these benchmarks: for instance, Greenwood, Shleifer, and You (2019) and Kenourgios et al. (2021) note that elevated P/E ratios relative to their historical mean tend to coincide with periods of speculative excess, while recent quantitative analysis of technology stocks from the likes of Lombardi & Pinter (2024) have similarly identified P/E multiples substantially above 20 as indicative of potential bubble conditions in the technology sector.

Following the data collection and initial calculation of the above marked out indicators, the empirical analysis will proceed in several stages. First, a graphical analysis of the NASDAQ index, which collectively contains technology companies of interest for both analyzed periods, illustrates the evolution of market valuation over time. Next, profitability indicators (Total return and CAGR) are presented for the selected top technology companies among each period — the Four Horsemen for the Dotcom era and the Magnificent 7 for the AI period — to evaluate investment performance at the firm level. Finally, the comparison of P/E ratios across the Dotcom and AI periods provides a quantitative basis for assessing whether current AI stock valuations reflect levels of overvaluation comparable to those observed during the ex-post confirmed Dotcom bubble.

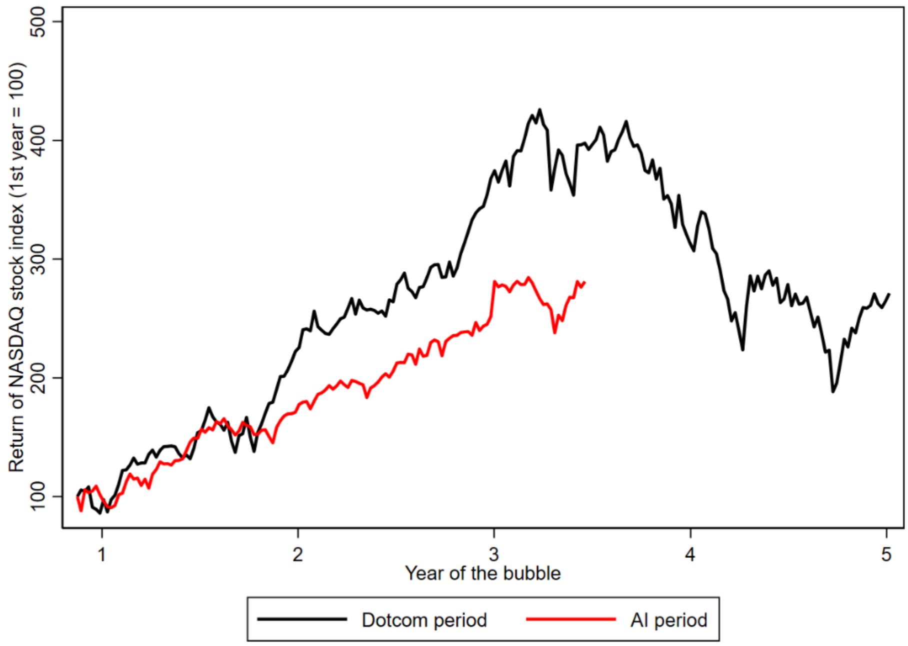
4 RESULTS

Our analysis begins with a simple graphical comparison of the market trajectories during the two investigated technology-inducted periods (shown below in Figure 1). For this purpose, the return of NASDAQ stock index was normalized to a starting value of 100. In terms of selected time horizons, they were intentionally chosen to ensure comparability, in both cases starting from the initial phases of technological euphoria (1998–2003 for Dotcom and 2022–2025 for AI), which represent potentially similar bubble-formation stages.

During the Dotcom period, the index experienced rapid growth, culminating in its peak on March 10, 2000 with price per share of 5,132 at approximately 399 points. Subsequently, the Dotcom bubble underwent a sharp price correction, during which the index declined precipitously back below the two hundred levels, erasing the majority of previously accumulated capital gains and marking the end of this speculative cycle.

The trajectory for the AI period shows a broadly similar pattern: following the launch of ChatGPT software and the surge of AI-related interest in late 2022, the NASDAQ index has steadily increased, though in the second year of the boom the growth pace started slightly lagging behind the slope of the Dotcom bubble. A notable correction occurred in early 2025, likely triggered by the newly announced U.S. tariff policies and concerns over a potential reignited trade war with China, a key supplier of AI chips. However, the index shortly resumed its upward trajectory afterwards, continuing to reach new highs by late 2025. This indicates that the AI boom has not yet reached a peak comparable to the Dotcom climax and may continue beyond the approximately three-year cycle observed during the Dotcom period before fully crystallizing its ultimate development path.

Figure 1: Comparison of historical return of the NASDAQ 100 index during the Dotcom and AI periods



Source: own processing according to data from Yahoo Finance

Next, we examine the return indicators presented in Table 1 to provide a more quantitative comparison of the Dotcom and AI periods. Starting with the Total return, it is immediately evident that over equivalent two-year periods (Dotcom: 10 March 1998 – 10 March 2000; AI: 10 October 2022 – 10 October 2025), the Dotcom bubble exhibited substantially higher growth than the AI boom, with a total return of 299.7% compared to 127.9%. This remarkable outperformance is further underscored when compared to the S&P 500 benchmark, which rose only 43.2% during the Dotcom period, highlighting the extraordinary concentration of gains in the technology sector at that time. In contrast, the AI period shows a less extreme outperformance relative to the overall market benchmark (86.9%), showing that the rally is to an extent more broadly distributed across the whole market and less narrowly tech-concentrated than during the Dotcom bubble.

Table 1: Return indicators for NASDAQ during Dotcom and AI period

Indicators	Dotcom Bubble (1998–2000)	AI Boom (2022–2025)
Total return	299.7 % benchmark: 43.2%	127.9 % benchmark: 86. 9%
Average annual return	173.3 %	63,9%
Compound annual growth rate (CAGR)	111.3%	31.7%
Highest growth within the index	1553 % (Innodata Inc.)	2027 % (Palantir Technologies)
Highest P/E ratio within the index	1001 (Yahoo!)	623 (Palantir Technologies)

Source: own calculations according to data from Yahoo Finance and Bloomberg

The difference in performance is also evident in average annual returns and compound annual growth rates (CAGR), with the Dotcom period showing 173.3% average annual return and 111.3% CAGR versus 63.9% and 31.7% for the AI period, respectively. However, when examining individual stock performers, it is revealed that the AI period has produced some exceptionally high growth cases: for instance, Palantir Technologies Inc. (PLTR) recorded a two-year return of 2,027%, surpassing the highest-performing Dotcom stock in our dataset (Innodata Inc., 1,553%). It should be noted, however, that during the Dotcom era most companies were not yet publicly traded and awaited IPOs, so other firms may have experienced even larger growth that is not captured in publicly available data.

Finally, in terms of valuation, both periods feature companies with extreme future growth expectations, as reflected in the highest P/E ratios: Yahoo! reached 1,001 at the peak of the Dotcom period, while Palantir reached 623 during current AI boom. These findings indicate that speculative expectations were significant in both episodes, setting the stage for our subsequent analysis of P/E ratios to assess potential overvaluation.

Within the below depicted Table 2 we present a comparison of P/E ratios for the dominant technology firms of each period to universally quantify the degree of market overvaluation. During the peak of the Dotcom bubble in 2000, the then famous Four Horsemen group — consisting of companies Microsoft (77), Intel (183), Cisco (196), and Oracle (159) — exhibited extraordinarily high P/E ratios, with Cisco reaching 196, meaning it was traded at nearly 200 times the earnings it actually generated. These extreme multiples highlight the speculative nature of the market, where prices were driven far above fundamental earnings acquired from internet-related activities.

Table 2: P/E ratios of leading tech companies during each technological era

Time period	Company	Stock ticker	P/E ratio
Dotcom bubble (Four Horsemen)	Microsoft	MSFT	77
	Intel	INTC	183
	Cisco	CSCO	196
	Oracle	ORCL	159
AI boom (Magnificent 7)	Apple	AAPL	37
	Microsoft	MSFT	36
	NVIDIA	NVDA	67
	Amazon	AMZN	60
	Meta	META	27
	Alphabet	GOOGL	23
	Tesla	TSLA	79

Source: own calculations according to data from Yahoo Finance

In comparison, the AI period shows, as of end of 2024, definitely elevated, but relatively lower annual P/E ratios for the Magnificent 7. Tesla tops this group at 79, followed by Nvidia at 67, Amazon at 60, Apple at 37, Microsoft at 36, Meta at 27, and Alphabet at 23 times their earnings value. While all these ratios clearly exceed the commonly cited long-term benchmark of 20 for indicated overvaluation (Shiller, 2000; Lombardi & Pinter, 2024), for now they remain substantially below the extreme levels of the Dotcom era. Notably, the highest P/E ratio observed in the AI sample — 79 for Tesla — remains less than half of that highlighted during the Dotcom peak, where Cisco traded at a multiple of 196. This may reflect the fact that many AI-related companies are already generating substantially growing earnings — particularly firms like NVIDIA, which continues to deliver strong revenue and therefore somewhat support its unprecedently elevated valuation. Since the P/E ratio is, as was shown in formula 3, calculated by dividing price by earnings, higher earnings increase the denominator and therefore result in lower P/E values, helping to justify the comparatively lower ratios seen in the ongoing AI boom.

This all together suggests that while AI valuations are definitely above the historical norms and indicate potential overvaluation, the intensity of speculative excess has not yet reached the extreme levels observed during the

Dotcom bubble, and the growth story for AI companies may still have the momentum to continue if earnings keep expanding.

5 DISCUSSION AND CONCLUSION

This paper intended to examine the ongoing AI boom in the complementary context of historical technology bubbles, with a particular focus on the Dotcom era. To achieve this, we conducted a comparative analysis of valuation metrics and performance indicators, with special attention to the Shiller's P/E ratio as a benchmark for quantifying potential overvaluation.

Our results indicate that both the Dotcom and AI periods exhibit signals of overvaluation based on the historical threshold of P/E ratio at 20, as was previously formalized by Shiller (2000). During the Dotcom era, the NASDAQ technological stock index experienced an extraordinary total return of 299.7% over the two-year period from March 1998 to March 2000, with individual companies achieving growth of 1,553%, and extreme P/E ratios reaching over 1000. In comparison, the AI period from October 2022 to October 2025 also shows elevated aggregated returns (total return of 127.9%) and high-performing individual stocks such as Palantir Technologies Inc. with a two-year growth of 2,027% and a peak P/E of 623. While these numbers indicate significant optimism and potential overvaluation, they overall remain lower than the extreme multiples observed during the Dotcom bubble. These findings are consistent with referred previous research, such as Shiller (2000) and Ofek and Richardson (2003), who documented excessive optimism and unsustainable valuations as the defining features of the Dotcom era. Similarly, recent authors like Floridi (2024) and market analysts from Morningstar (2025) or J.P. Morgan Asset Management (2024) have pointed to comparable speculative dynamics in the ongoing AI boom, though often emphasizing stronger earnings fundamentals as a moderating factor. Our results therefore align with this view, suggesting that while the current AI market exhibits speculative tendencies, its valuation structure is more grounded in actual profitability compared to the purely irrational euphoria-driven Dotcom period.

However, several limitations of the research should be noted. First, regarding data limitations, the analysis relies exclusively on publicly available stock data, which excludes private companies, pre-IPO firms, and micro-level company financials that are often difficult to access or require multiple subscriptionbased databases. Additionally, the relatively short time frame (three to five years for each technological boom) limits the assessment of long-term sustainability of valuations. Second, methodological limitations stem from the reliance on solely P/E ratios and aggregated return indicators as proxies for overvaluation or market irrationality. These metrics do not fully capture the scope of the impact of priced-in expectations, or other qualitative factors such as innovation's future potential and investor sentiment. Future research could therefore extend this study by incorporating a broader range of companies beyond the Magnificent 7, analyzing their role in larger technology indices to better capture market concentration effects, as well as eventually applying more complex econometric models that integrate economic, financial, and behavioral variables including the likes of investor sentiment, optimism, and herding — factors highly relevant for the study of innovation-induced financial bubbles.

Beyond these limitations, the paper contributes to the literature by presenting a systematic quantitative comparison of the AI boom with the Dotcom bubble, highlighting both similarities and differences in market behavior and valuation extremes. It fills a notable gap in current research, as few studies yet have examined AI-related market dynamics with this combined approach of graphical, performance indicator, and Shiller P/E analysis. Utilizing multiple research methods, our findings suggest in a novel way that although both technological waves demonstrate valuation levels exceeding traditional overvaluation thresholds, the AI period appears comparatively healthier due to stronger earnings performance — an insight that may be valuable for investors in forming unique strategies and making informed future decisions.

Nevertheless, while today's valuations are supported by better financial fundamentals, the sustainability of the AI boom seems to be dependent on continued exceptional earnings that markets are already pricing in. This dependency, coupled with other identified parallels to the Dotcom bubble, introduces a latent risk: should earnings growth fail to meet investors' expectations, the AI-driven stock market could experience sharp correction even if AI's technological transformation continues. This dynamic emphasizes the importance of ongoing monitoring and continued research, following up on the framework presented in this paper, to better anticipate and mitigate any potential negative consequences of another innovation-driven bubble.

AFFILIATION

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CITATION LIST

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MEASURING DIGITAL GOVERNMENT READINESS IN THE EU: CONSTRUCTION AND APPLICATION OF A DESI-BASED COMPOSITE INDEX

Vojtěch Müllner, Kamil Nečas

Abstract: *The article proposes a composite index of public sector readiness for digitization in EU countries. Based on selected DESI indicators—connectivity, digital skills and use, digital intensity of small and medium-sized enterprises, and quality and use of e-services—we compile comparative scores and country profiles with their strengths and weaknesses using min-max normalization according to two alternative weighting systems. Both specifications lead to a stable ranking of countries. The best results are achieved not only by robust networks with very high capacity (VHCN) and gigabit connectivity, but also by higher digital skills, greater use of e-government, and more advanced digitization of SMEs. In the context of the EU's Digital Decade policy, the index highlights differences between countries that may hinder the Europe-wide digitization of public services.*

Keywords: *digital government; DESI; composite index; connectivity; digital skills; e-government; SMEs; 5G; VHCN; Digital Decade.*

JEL classifications: *O33; O38; H83; C43; L86*

1 INTRODUCTION

The digital transformation of the EU public sector is firmly anchored in the "Digital Decade 2030" policy agenda, which sets measurable targets for connectivity, skills, and the digitization of businesses and public services (European Union, 2022). This program complements the DESI assessment framework and international comparative studies such as the OECD *Digital Government Index* and the *eGovernment Benchmark*. Together, they suggest that success depends on a combination of infrastructure, skills, governance, and user experience (OECD, 2024; European Commission, 2024a). At the same time, the current literature recommends assessing not only hard inputs (networks and technologies) but also the actual use and quality of services provided (Mergel, Edelmann & Haug, 2019; Janowski, 2015; Dunleavy, 2006; Vial, 2019). On this basis, we propose a targeted composite readiness index that selectively draws on DESI indicators and follows established guidelines for compiling composite indicators (OECD & JRC, 2008).

The digitization of the public sector in Europe is a major political priority, most clearly articulated in the Digital Decade, which sets measurable targets for connectivity, skills, digital services, and data (European Commission, 2025a). However, these targets are not achievable on their own: their achievement depends on preconditions arising from the external environment (regulation, technology markets, standards, cybersecurity, and trust), the internal environment of public organizations (administration, processes, capacities, and knowledge), and demand-side factors, specifically the readiness and behavior of users (citizens and businesses) (Vial, 2019; Klievink et al., 2017; Mergel, Edelmann & Haug, 2019). Digitization also means a shift towards greater integration of previously fragmented agendas, enabling more targeted and effective management (Dunleavy, 2006). Systematic reviews and case studies further show that the results of digital transformation are multidimensional and depend on a combination of infrastructure conditions, user readiness, and the organizational capacities of public institutions (Haug, Dan & Mergel, 2024; Andersson, Hallin & Ivory, 2022; Alvarenga et al., 2020). In the European context, this trajectory is complemented by an emphasis on digital sovereignty and the goals of the digital decade, which prioritize not only the expansion of digital services but also their quality, security, and acceptance throughout society (Burwell & Propp, 2020; European Commission, 2025b).

On this basis, the article draws on comparable DESI data to describe the current level of public sector digitization in EU Member States and identify differences between countries in key areas, namely infrastructure and connectivity, user (citizen) readiness and behavior, the readiness of small and medium-sized enterprises for digitization, and the provision and use of digital public services. DESI offers a reliable view not only of "hard" inputs (connectivity, network coverage, 5G), but also on demand-side factors (internet usage, basic digital skills) and service performance (use of e-government, quality and transparency of services), providing an overall view of readiness across the entire ecosystem, including the public sector, citizens, and businesses (European Commission, 2025b; Dobrolyubova, 2021).

The aim of the article is (i) to define and theoretically substantiate the key dimensions of public sector readiness for digitization concerning all major stakeholders (public institutions, citizens, businesses) and basic infrastructure; (ii) to measure the current level of digitization in EU countries using DESI indicators and to compile a composite readiness index that will enable cross-country comparisons and the identification of profiles of strengths and weaknesses; and (iii) interpret the observed differences concerning institutional and organizational capacities, demand-side readiness, and infrastructure conditions, and derive recommendations for digital governance policy within the Digital Decade framework (Vial, 2019; Klievink et al., 2017; European Commission, 2025b).

2 THEORETICAL AND CONCEPTUAL FRAMEWORK

This chapter defines the theoretical basis and conceptual logic for measuring the readiness of the public sector for digitization in EU countries. First, we briefly characterize the Digital Economy and Society Index (DESI), its strengths and limitations in relation to our goal. Then we define the areas (indicators) that form the core of our indicator. Finally, we describe the normalization procedure and two weighting scenarios for constructing the composite index.

2.1 DESI: what it measures and why it is not sufficient for our purposes

DESI is the European Commission's framework for comparing the digital maturity of Member States. It integrates indicators in four pillars: connectivity, human capital, digital integration, and digital public services (European Commission, 2025b). Its strength lies in its comprehensiveness and comparability between countries and over time, capturing both supply-side factors (e.g., network coverage, 5G) and demand-side factors (e.g., digital skills, internet usage), as well as the performance of e-government (European Commission, 2025a; Vial, 2019).

However, for our specific research question—the readiness of the public sector for digitization—the overall DESI index has two limitations. First, DESI tracks the broader digital economy and society; some areas (e.g., business digitization) are not a direct measure of public sector readiness, while key administrative prerequisites (e.g., interoperability, governance, trust) are relatively underrepresented (Mergel, Edelmann & Haug, 2019; Haug, Dan & Mergel, 2024). Second, the resulting scores combine availability with outcomes: supply-side indicators may suggest high readiness even when adoption and service quality remain low (Dobrolyubova, 2021). The literature consistently shows that the effects of digital transformation in the public sector are conditioned by institutional and organizational capacities, as well as user readiness on the demand side (Klievink et al., 2017; Andersson, Hallin & Ivory, 2022).

For these reasons, we propose a targeted composite readiness index composed of carefully selected DESI indicators that directly capture (i) infrastructure and connectivity, (ii) readiness and use by citizens, (iii) the digital intensity of businesses (as part of the broader ecosystem), and (iv) performance—and proxy indicators of trust—in the area of digital public services. This selection reflects an ecosystem view of digitalization and is consistent with the European Digital Decade framework (European Commission, 2025b; European Commission, 2024b).

2.2 Areas and their relevance to readiness

For clarity, the key indicators used in the composite index are summarized in Table 1. The table provides brief definitions, units, preferred interpretation, reference year of data, source, and weight of each indicator. In the following subchapters, we further elaborate on the individual items, justify their inclusion and weighting, and briefly discuss their limitations and interpretative nuances.

Table 1: Overview of indicators used in the composite readiness index

Area	Indicator	Definition	Unit	Weight
Infrastructure & connectivity	VHCN coverage (FTTH/B)	Coverage of households by very high-capacity networks (fiber/equivalent)	% of households	0.12
	Fixed ≥1 Gb/s	Share of fixed connections with speeds ≥1 Gb/s	% of connections	0.10

	Fixed ≥100 Mb/s	Share of fixed connections with speeds ≥100 Mb/s	% of connections	0.06
	5G coverage	Total outdoor 5G signal coverage	% of population/territory	0.08
	5G SIM share	Share of active 5G SIM cards in the population	% of population	0.05
Human capital & users	Basic digital skills	Percentage of the population with basic digital skills	% of people (16–74)	0.13
	Internet use (regular)	Percentage of the population regularly using the Internet	% of people (16–74)	0.10
Digitization of companies (SMEs)	SMEs ≥ basic DII (v4)	Share of SMEs using ≥4 of the 12 monitored digital technologies (DII v4)	% SME	0.11
Digital services & trust	E-government users	Percentage of citizens using online public administration services	% of people	0.06
	Digital public services – G2C	Scope and sophistication of services for citizens (end-to-end)	index (0–100)	0.07
	Digital public services – G2B	Scope and sophistication of services for businesses (end-to-end)	index (0–100)	0.07
	Transparency of service delivery, design & personal data	Transparency, user design, and working with personal data	index (0–100)	0.05

Source: own processing

2.2.1 Infrastructure and connectivity (network supply and capacity)

The basic prerequisite for readiness is the availability and capacity of fixed and mobile connections. The share of fixed connections with speeds ≥100 Mb/s reflects the spread of high-speed connections among the population, i.e., the ability of households and institutions to easily use audiovisual communication, online forms, and public administration transaction services. The ≥1 Gb/s indicator further distinguishes ultra-high-capacity connections (usually optical), which are essential for data-intensive public sector agendas – from telemedicine and large file processing to cloud solutions for public administration. Very high capacity network (VHCN) coverage in the form of fiber to the home/building (FTTH/B) measures the availability of next-generation infrastructure regardless of its current use; it creates the technological foundation for a digital state and mitigates regional differences in access to services.

In the area of mobile networks, overall 5G coverage enables ubiquitous access to electronic services and supports the development of the Internet of Things (IoT) in public policies (e.g., transport, public safety, crisis management). While coverage captures supply, the share of 5G SIM cards in the population reflects the actual use of this connectivity by users. Together, these indicators measure both technical readiness and connectivity adoption (European Union, 2025; European Commission, 2025c; European Commission, 2024b).

2.2.2 Human capital and user readiness (demand)

Technical accessibility alone does not guarantee the use of digital services. Basic digital skills represent the minimum level of competence required to use electronic services and are therefore a prerequisite for inclusive digitization; without these skills, a digital divide arises between different groups of the population (Mergel, Edelmann & Haug, 2019). The internet usage indicator (regular internet usage) adds a behavioral dimension to competencies and signals the extent to which society is truly online and ready to communicate with the state digitally. Combined, these two indicators distinguish countries where the main limitation is competence from countries where the challenge is habit or motivation to interact online (Eurostat, 2024b; Dobrolyubova, 2021).

2.2.3 Digital intensity of businesses (ecosystem)

The public sector operates within a broader digital ecosystem, where small and medium-sized enterprises (SMEs) play a key role. The indicator "share of SMEs with at least a basic level of digital intensity" (Digital Intensity Index, DII v4) shows how many companies routinely use basic digital technologies – e.g., cloud services, enterprise resource planning (ERP) systems, customer relationship management (CRM), e-commerce, and data analysis (Eurostat, 2024a). DII v4 is a "broad" index from Eurostat: it monitors 12 technology areas (including high-speed internet, advanced web features, social networks, online advertising, cloud, ERP/CRM, big data analytics, e-invoicing, cybersecurity, and e-commerce). A company has at least a basic level if it uses 4 or more of these technologies (Eurostat, 2024a).

Higher digitalization of companies also has a direct impact on public administration: it increases demand for G2B services, accelerates the standardization of data exchanges, and improves the ability of companies to use e-procurement and e-invoicing. At the same time, it acts as a multiplier of the effects of public digital investments—the more digitally advanced the business environment, the greater the benefits generated by public digital projects (Vial, 2019)

2.2.4 Digital public services and trust (performance and quality)

The mere availability of electronic services does not guarantee their use. Users of e-government measure the level of acceptance by citizens and thus provide a direct indicator of the actual impact of digitization. The indicators Digital Public Services for Citizens (G2C) and Digital Public Services for Businesses (G2B) assess the breadth and sophistication of the service portfolio, including the scope of complex online processes. Finally, Transparency of service delivery, design, and personal data captures quality and trustworthiness—it includes transparency, user-centered design, and personal data handling. This dimension is key to the legitimacy and sustainability of digital governance: without trust and positive user experiences, investments in e-services are unlikely to translate into their effective use (European Commission, 2025a; Burwell & Propp, 2020).

In summary, this selection of areas reflects the view that the digitization of the public sector is an ecosystem process: results depend simultaneously on technological capacity (fixed and mobile connectivity), user readiness (skills and actual online behavior), the digital maturity of the economy (small and medium-sized enterprises), and the quality and use of public e-services (Vial, 2019; Haug, Dan & Mergel, 2024). It is the combination of these dimensions that allows for a meaningful assessment of readiness—not only the state of the infrastructure, but also the ability of society and institutions to transform that infrastructure into trusted services in the real world.

2.3 Construction of a composite index of public sector readiness

In order to unify the indicators on a common scale and enable their aggregation, we convert all values to the interval ⟨0; 1⟩, where 1 corresponds to the best observed value and 0 to the worst. We use the standard min–max transformation:

$$x'_{i,k} = \frac{x_{i,k} - min_j\, x_{j,k}}{max_j\, x_{j,k} - min_j\, x_{j,k}}$$

Where $x_{i,k}$ is the original value of indicator *k* for country *i,* and $x'_{i,k}$ is its normalization. All our indicators have a positive orientation (higher = better), so there is no need for inversion. If $max_j\, x_{j,k} = min_j\, x_{j,k}$, we set $x'_{i,k} = 1$ for all countries for a given indicator. This procedure avoids mixing units of measurement and preserves the relative ranking of countries. Normalization was used not only for the index, but also for the indicator Share of fixed broadband subscriptions >= 1 Gbps (2024). As mentioned earlier, this indicator belongs to the infrastructure domain. By normalizing this indicator, we obtain a scale within countries that are best prepared in terms of high-speed connectivity and those that are worst prepared. In this indicator, 100 is the best-prepared country, which is France, considered the leader in this domain.

2.3.1 Equal weights in the index

Since we have chosen a total of 12 indicators, K=12 is and $x'_{i,k}$ are their normalized values. We calculate the resulting index for country *i* in two ways to test the robustness of the choice of weights:

$$Index_i^{(A)} = \frac{1}{K}\sum_{k=1}^{K} x'_{i,k}$$

2.3.2 Differentiated weights

Below, we present the rationale for the differentiated weighting coefficients used in the composite readiness index. The weighting system reflects the relative importance of each area for the public sector's ability to expand and maintain digital services within the ecosystem of citizens and businesses. It is based on consistent findings that the results of digital transformation are conditioned by the interaction of technical capacities, human capital, acceptance, and service quality/trust (Vial, 2019; Haug, Dan & Mergel, 2024).

Infrastructure and connectivity. In this area, VHCN coverage (0.12) carries the highest weight, as the availability of very high capacity networks (optical or equivalent) is a long-term structural condition for gigabit services and for reducing the regional digital divide; this is a "hard" condition that underpins the capacity of the entire digital administration (European Commission, 2025a). Furthermore, the share of gigabit (≥1 Gb/s) connections (0.10) captures the actual penetration of ultra-high-capacity access and thus the readiness of users for data-intensive agendas (eHealth, cloud in the public sector). This indicator is closer to actual usage than mere availability. As already mentioned, the values of this indicator are normalized for the purposes of our index, as we cannot define when a country is 100% connected. We can only monitor the status of this connectivity, as we are interested in how countries compare with each other. France achieved the highest value, with 58% of all connections, although we know that 100% is not achievable. For this reason, we normalized the data and stated that France is 100% ready, and we compared other European countries to this level. The share of fixed connections ≥100 Mb/s (0.06) is weighted lower because it reflects the increased current standard but no longer represents a forward-looking threshold; analytically, it serves as an intermediate step between the basic and gigabit classes. We assign a slightly higher weight to total 5G coverage (0.08) because 5G provides a mobile platform for accessing electronic services and for IoT in public policies (transport, public safety, crisis management), even though it does not in itself ensure the quality of end-to-end fixed services. Finally, the share of 5G SIM cards in the population (0.05) has the lowest weight in the infrastructure group: it is a proxy indicator of adoption that complements coverage, but its contribution depends on tariff structures and service offerings; therefore, we use it primarily as a calibration indicator of usage rather than as a structural pillar (European Commission, 2025a). The data for this indicator has been adjusted because two countries lacked information, and the absence of a rating would have affected the overall index result. For this reason, values equal to the average of the other countries were added to these countries. This procedure is based on methodological recommendations for data cleaning. Another adjustment to this indicator was to set an upper limit of 100%, as the indicator focuses on the number of 5G SIM cards in the population, and it is quite common for users to have more than one mobile phone. For this reason, some countries had indicator values of more than 100%. For this reason, we will consider this limit to be the maximum, and values above this limit will not be counted. This procedure is in line with data winsorization.

Human capital and user readiness. We assign the highest weight in the index to basic digital skills (0.13), as the literature consistently shows that without a minimum level of skills in the population, there is insufficient demand for electronic services and investments in technology do not yield results (Mergel, Edelmann & Haug, 2019; Vial, 2019). We also assign relatively high weight to internet usage (0.10): regular internet usage is a behavioral indicator of adoption, which, together with skills, forms the basis of demand for digital interactions with the state (Dobrolyubova, 2021). Together, this pair receives a combined weight that exceeds any single infrastructure item, reflecting the assumption that readiness on the demand side ultimately determines the actual impact of public digital services (Haug, Dan & Mergel, 2024).

Digital intensity of businesses. The indicator " SMEs with at least a basic level of digital intensity" (0.11) has a relatively high weighting because small and medium-sized enterprises dominate the business sphere and supply chains, and their digital practices create constant pressure on the quality of interactions between government and businesses (electronic public procurement, electronic invoicing, data interfaces). The literature also emphasizes that organizations—both public and private—must align technology with strategy and capabilities; in a more digitally intensive business environment, public digital investments exhibit stronger multiplier effects and increased requirements for interoperability, standardization, and data exchange with the state (Vial, 2019; Guenduez et al., 2025).

Digital public services and trust. In this area, we distinguish between acceptance, supply/maturity, and trust/quality. E-government users (0.06) capture the outcome—the actual use of e-services by citizens—and are therefore included as an outcome indicator, albeit with a lower weight than the skills that are a prerequisite for adoption (Dobrolyubova, 2021). Digital public services for citizens (0.07) and ...for businesses (0.07) have the same medium weight: the supply and maturity of G2C and G2B agendas form the backbone of digital administration, and parity reflects the need for balanced development of services for both citizens and businesses (European Commission, 2025a). Transparency of service delivery, design, and personal data (0.05) adds the dimension of trust and legitimacy to these functional indicators—including transparent processes, user-centered design, and personal data handling. Although this is a prerequisite for sustainable development, it is relatively difficult to make comparisons between countries; therefore, we assign it a balancing rather than a dominant weight.

Overall, the weights (sum = 1.00) create a balanced profile: the highest contribution comes from basic digital skills (0.13) and VHCN (0.12) as a pair of key conditions of demand and supply; followed by SME digital intensity (0.11) and internet use (0.10), which capture ecosystem effects and actual online behavior. Gigabit penetration (0.10), 5G coverage (0.08), and G2C/G2B maturity (0.07 + 0.07) support scaling and service quality, while ≥100 Mb/s (0.06) and e-Government users (0.06) act as stabilizing elements between structure and results. 5G SIM (0.05) and transparency (0.05) add an adoption and trust dimension to the index. This weighting structure is consistent with the literature, which recommends strengthening the structural capacity of the network, human skills, and ecosystem interoperability, while monitoring the adoption and quality of the resulting services. Aggregation is performed using a weighted sum:

$$Index_i^{(B)} = \frac{1}{K}\sum_{k=1}^{K} w_k x'_{i,k}$$

This dual weighting allows us to assess whether the ranking of countries is primarily influenced by balanced performance across all areas or whether it is sensitive to critical factors (infrastructure, skills, acceptance, and quality of services). In alignment with the academic literature, we also distinguish between "hard" prerequisites and "soft" capacities and outcomes, which together influence the public sector's ability to expand digitization (Klievink et al., 2017; Haug, Dan & Mergel, 2024).

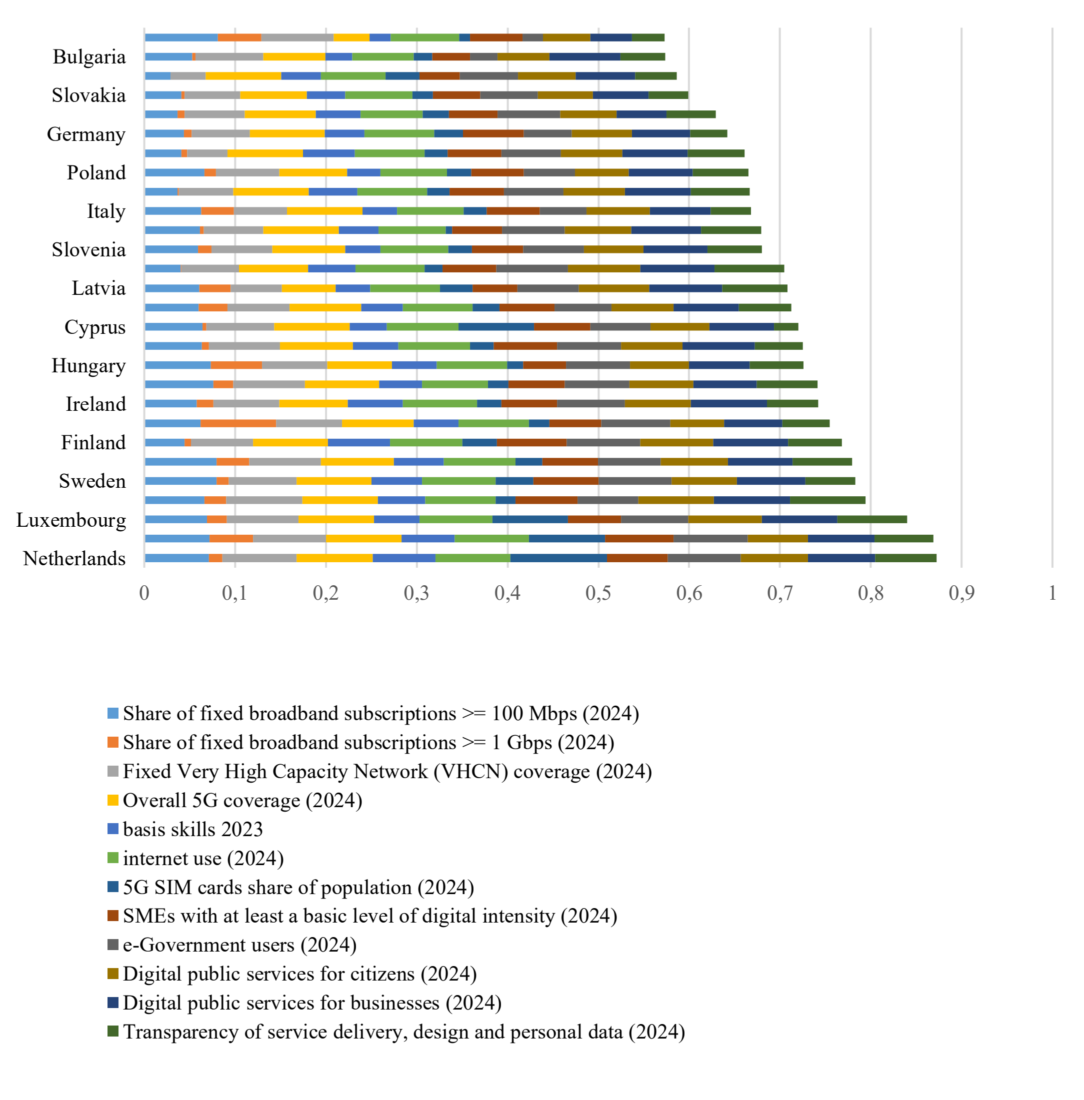
To measure the impact of weighting schemes, we calculate the Pearson correlation (sensitivity of continuous scores) and Spearman rank correlation (stability of ordinal rankings) between the two versions of the index. High correlations would indicate that alternative weights only marginally adjust the results; low correlations would indicate that weighting has a significant impact on scores and/or rankings.

3 RESULTS AND INTERPRETATION

We understand digital readiness in the context of public services as the ability of the state to design, operate, and scale user-friendly, secure, and interoperable digital services that citizens and businesses actually use in the long term. It is therefore not just a matter of "supply" in the form of infrastructure or a portal, but of the entire chain from available high-capacity connectivity, through the skills and willingness to use the service, to institutional quality and impact (time savings, lower administrative burden, better accessibility). The structure of the index reflects this: it combines connectivity (≥100 Mb/s, ≥1 Gb/s, VHCN, 5G), the demand side (5G SIM, internet usage, basic digital skills), business readiness (digital intensity of SMEs), and e-government maturity (share of users, services for citizens and businesses, transparency of services, and data management). The results of both variants show a very high stability of the ranking (Spearman $\rho = 0{,}995$; Pearson $r = 0{,}9896$), meaning that the choice of weights only slightly adjusts the ranking. Despite the fact that the results are very similar, we will present both the index with equal weights and the index with differentiated weights separately.

Figure 1 ranks EU countries (plus the EU aggregate) according to a composite digital readiness index on a scale of 0–1, with all indicators weighted equally. Scores range from 0.57 (Romania, Bulgaria) to 0.87 (Netherlands), with the EU aggregate at 0.71. This confirms a relatively smooth but marked differentiation between a small group of leading countries, a compact middle group, and a clearly identifiable group of lagging countries. At the top of the ranking are long-standing leaders in digitization, such as the Netherlands (0.87), Denmark (0.87), and Luxembourg (0.84), followed by Malta (0.79) and Sweden (0.78). These countries combine robust networks with very high capacity (VHCN), a large share of fast broadband connections (≥100 Mbps and often ≥1 Gbps), and strong 5G coverage with high mobile network penetration. At the same time, they achieve above-average results in digital skills, the digitization of small and medium-sized enterprises, and the provision and use of digital public services. Their advantage is clearly visible in the graph as a slight "bounce" from the rest of the sample: they are approximately 0.15–0.20 points above the EU level.

Figure 1: Composite index of readiness for digitization—version with equal weights

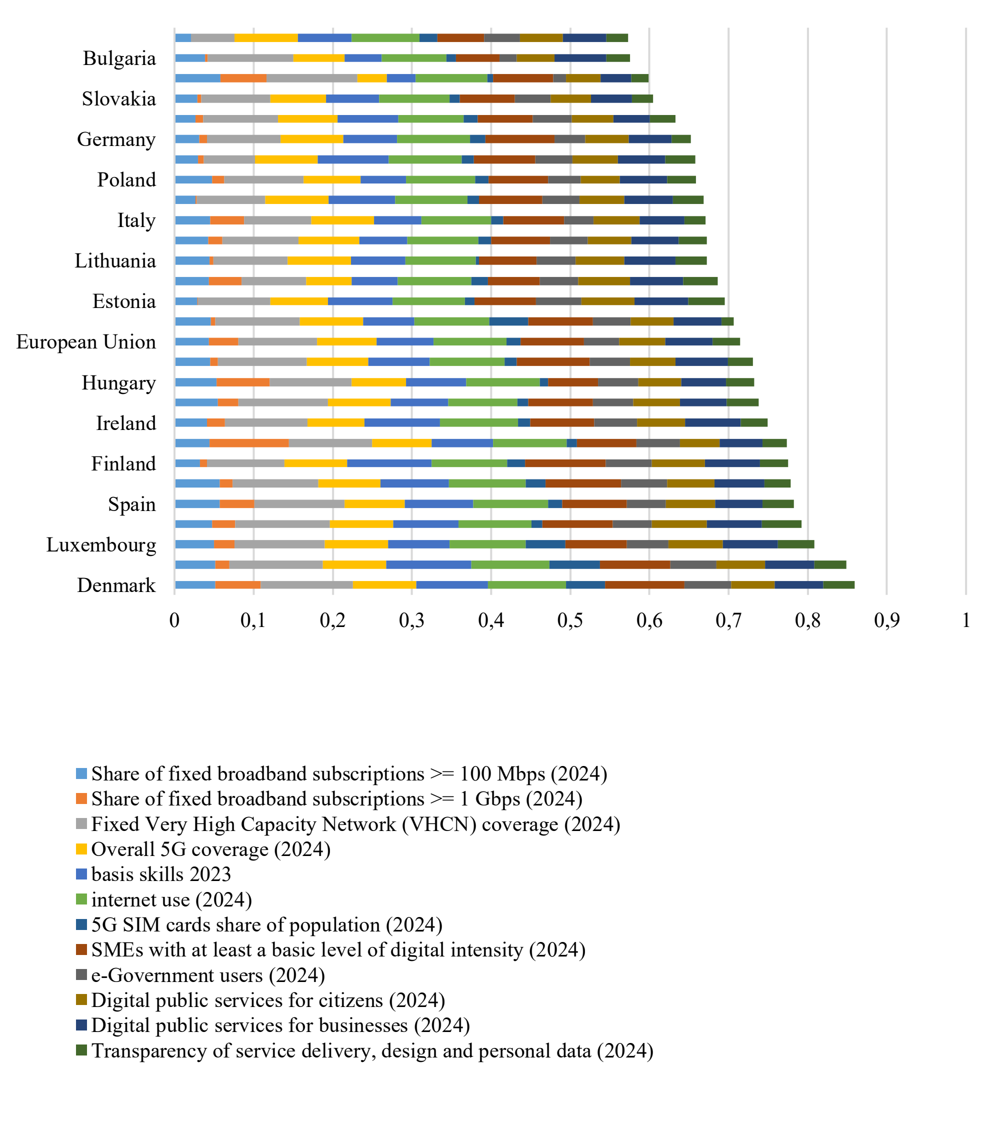


Source: own processing

The middle of the distribution is dense and compact. Countries such as Spain (0.78), Finland (0.77), and France (0.75) are closely followed by Ireland and Portugal (both around 0.74), Hungary (0.73), Belgium (0.72), Cyprus (0.72), and the EU aggregate (0.71), closely followed by Latvia (0.71) and Estonia (0.70). The differences between these countries are small – in many cases, only a few hundredths of a point – so even a slight improvement or deterioration in one dimension (such as the digital intensity of small and medium-sized enterprises or the use of e-government services) could change their relative position. Further down the ranking are Slovenia (0.68) and Lithuania (0.68), followed by Italy (0.67), Austria (0.67), and Poland (0.67). Czechia scored 0.66, which is approximately 0.05 points below the EU average, but still ahead of Germany (0.64), Croatia (0.63), and Slovakia (0.60). This suggests that Czechia's basic prerequisites for digitization—infrastructure, skills, business digitization, and e-services—are solid but not outstanding: while the country is not among those lagging, it still falls significantly short of the performance of the leading countries.

At the bottom of the ranking are several countries with scores significantly lower than the EU average. Greece (0.59), Bulgaria (0.57), and Romania (0.57) are at the very bottom, with Slovakia (0.60) and Croatia (0.63) only slightly above them. Their gap with the leading countries is approximately 0.25–0.30 points on a 0–1 scale, pointing to deeper structural differences in digital readiness. These lower scores can be explained more by other dimensions of the index than by the mere availability of technology. These countries generally have lower levels of digital skills among the population and parts of the workforce, which limits the ability of citizens and employees to take full advantage of digital tools and services. At the same time, the digitization of businesses—especially small and medium-sized enterprises—is weaker, with lower use of advanced solutions such as cloud services, data analytics, or online sales channels. The development and use of e-government is also progressing more slowly: a smaller proportion of citizens communicate with public authorities online, comprehensive digital services are less common, interoperability between registries remains limited, and the user experience is often suboptimal. The bottom of the ranking thus reflects not only technological gaps, but above all organizational, skill-related, and institutional shortcomings that prevent these countries from exploiting the potential of digitization to the same extent as northern and western Member States.

Figure 2: Composite index of readiness for digitization—version using different weights



Source: own processing

The results of the composite digital readiness index with differentiated weights are shown in Figure 2. The weights assess indicators according to their importance, and as a result, the overall ranking has changed for half of the countries. The top of the ranking remains very similar, with the two leading countries swapping places: Denmark (0.859) moves into first place ahead of the Netherlands (0.849), followed by Luxembourg (0.809) and Malta (0.792). Spain (0.782) now rounds out the top five, slightly ahead of Sweden (0.779) and

Finland (0.775), while France (0.774) remains firmly among the top-ranked countries. All of these countries score between 0.14 and 0.18 points higher than the EU average (0.715) on a scale of 0 to 1.

The middle of the ranking can be described as relatively compact. Ireland (0.749), Portugal (0.738), Hungary (0.732), and Belgium (0.731), together with Cyprus, Estonia, Latvia, Lithuania, and Slovenia, cluster close to the EU average. Compared to the version with equal weighting, most of these countries have shifted up or down by at most one position: for example, Spain and Denmark move up one place, Estonia and Lithuania improve slightly, while the Netherlands, Sweden, Cyprus, and Latvia fall by one place. These changes are small in absolute terms, but they show that when greater weight is given to actual usage and the quality of services, countries with more connected users and more digitally intensive SMEs gain a slight advantage over countries whose strengths lie more in infrastructure.

Czechia scores 0.658 and remains in 22nd place, approximately 0.06 points below the EU average, but still ahead of Germany (0.653), Croatia (0.633), and Slovakia (0.604). Unlike in the evenly weighted index, its position does not change, but the weighted variant highlights an important nuance: Czechia performs relatively well in several "soft" dimensions (e.g., e-government users, the digital intensity of small and medium-sized enterprises), but not well enough to close the gap with the leading group. The country thus remains in the lower half of the ranking, with solid but not outstanding performance when greater emphasis is placed on the adoption and quality of services.

At the bottom of the ranking, we again find a group of countries with scores significantly lower than the EU average. Romania (0.599), Bulgaria (0.575), and Greece (0.573) occupy the last three positions, with Slovakia (0.604) and Croatia (0.633) only slightly above them. The gap between these countries and the leading countries is approximately 0.25–0.29 index points, indicating deeper structural differences. In the weighted version, Romania improves slightly compared to the equally weighted index, while Greece falls to last place. This suggests that the main obstacles at the bottom of the ranking are not only related to connectivity, but also to basic digital skills, the digital intensity of small and medium-sized enterprises, and the regular use of e-government services. In practice, fewer citizens and businesses have integrated digital tools into their daily behaviour, and public services are less often provided in a seamless, user-oriented digital form.

Overall, the weighted index highlights the “usage gap”. It shows that the real difference between the “Top 5” and the “Bottom 5” is not only the availability of fast networks, but above all, how intensively citizens, businesses, and public institutions actually use digital channels.

4 RECOMMENDATIONS AND IMPLICATIONS

The results suggest that true readiness is not determined solely by network availability, but also by the widespread and trusted use of digital services among the population and businesses. This conclusion is in line with international standards and guidelines that emphasize human-centered design, interoperability, and quality of service (OECD, 2024; European Commission, 2024a), as well as with the Digital Decade 2030 policy, which sets targets for connectivity, skills, and the digitization of businesses and public services (European Union, 2022). Particular emphasis should be placed on trust and digital skills, which have a significant impact on the willingness to use services (Bélanger & Carter, 2008; van Deursen & van Dijk, 2014).

Based on the index results, EU countries can be divided into four groups with generally similar characteristics.

4.1 Group I – Leaders (score > 0.8)

Countries in this group typically combine strong connectivity, relatively advanced digital skills, and high levels of use of digital public services and business digitization. High-quality fixed and mobile networks are available, e-government services are integrated into everyday life and used by a large proportion of the population, and many small and medium-sized enterprises achieve at least a basic level of digital intensity. Governance and management systems tend to support common standards, interoperability, and the monitoring of user experience. The main challenges in this group often relate to the inclusion of remaining non-users, further improving the quality and resilience of services, and making better use of data and new technologies.

4.2 Group II – Strong performers (0.7–0.8)

In this group, the overall level of digital readiness is above the EU average, but certain gaps and inconsistencies remain. Connectivity is generally good, and there is a wide range of e-government services, but their uptake can vary between regions and population groups, and some key life events may still involve administrative barriers. Digital skills are relatively strong but unevenly distributed; small and medium-sized enterprises are progressing in their digitalization, although integration with public digital services is not always seamless. Public administration is functional but may be less consistent in enforcing common standards across sectors. Typical priorities include reducing differences in usage, simplifying user procedures, and strengthening the links between infrastructure, skills, and service usage.

4.3 Group III – Catching up (0.6–0.7)

Countries in this group often show mixed results: basic connectivity is available, but the use of advanced networks and digital services lags behind. Barriers on the demand side—such as lower digital skills among certain groups, limited trust, or low perceived usefulness—may limit the uptake of e-government and digital tools for business. Digital public services may exist but remain fragmented across institutions, with problems of interoperability and data quality. Small and medium-sized enterprises have lower digital intensity on average. Typical areas for improvement include increasing the actual use of existing services, strengthening skills in low-usage groups, and gradually improving the cohesion and reliability of the digital public sector.

4.4 Group IV – Basic development (< 0.6)

In this group, several key elements of digital readiness are still at an early stage of development. High-quality fixed and mobile connectivity may be limited or unevenly distributed, affordability may be an issue, and the overall level of digital skills and service usage is relatively low. Digital public services and interoperability frameworks are often at an early rather than an advanced stage, and governance structures may be fragmented. In these countries, the main focus is usually on building and stabilizing the basic “foundation layer”: improving access to reliable connectivity, strengthening basic digital skills, introducing robust digital identity and basic e-government services, and gradually developing common standards and data infrastructure.

Overall, the composite index provides a comparative overview of these four profiles and highlights relative strengths and weaknesses, but it does not capture all institutional, legal, or socioeconomic aspects of digital transformation. Any policy conclusions should therefore be complemented by more detailed country-specific analyses and qualitative evidence.

5 CONCLUSION

The analysis shows that cutting-edge connectivity is necessary but not sufficient; the real differentiator in readiness is the transformation of infrastructure into mass and trusted use. This conclusion is consistent with international benchmarks and academic literature, which emphasize the interconnection of networks, skills, governance, and user experience (OECD, 2024; European Commission, 2024a; Bélanger & Carter, 2008; van Deursen & van Dijk, 2014). Both variants of our composite indicator (equal vs. weighted weights) give a stable picture of the ranking of countries, with the weighted version—which takes into account the greater importance of basic digital skills, e-government adoption, and service quality—slightly favoring countries that are able to translate connectivity into actual use. A group interpretation of the results confirms that leaders (score > 0.8) accumulate strong VHCN/gigabit, high skills, and widespread adoption of e-services; the middle (0.7–0.8) tends to encounter friction in life situations and uneven adoption; catching up (0.6–0.7) address demand barriers and weaker interoperability; and lagging (< 0.6) lack basic layers of readiness (skills, eID, quality registries). Politically, this implies a shift from "digital-by-default" to usage-by-design: targeting skills and motivation to use, increasing trust through transparent data handling and secure identity, redesigning key life situations (mobile-first, once-only), and connecting SMEs to state data flows – in line with the Digital Decade 2030 Policy Program (European Union, 2022). Methodologically, the benefits of transparent min-max normalization and working with sub-indices are confirmed; given the limitations of available indicators (mixing inputs and outputs in DESI), we recommend sensitivity analyses, dual reporting (equal vs. weighted weights), and deeper interpretation of sub-indices as recommended by the OECD & JRC Handbook (OECD & JRC, 2008).

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