

THE CONNECTED WORLD

GREASING THE WHEELS OF THE INTERNET ECONOMY

A COUNTRY-BY-COUNTRY E-FRICTION ANALYSIS



BCG

THE BOSTON CONSULTING GROUP

The Boston Consulting Group (BCG) is a global management consulting firm and the world's leading advisor on business strategy. We partner with clients from the private, public, and not-for-profit sectors in all regions to identify their highest-value opportunities, address their most critical challenges, and transform their enterprises. Our customized approach combines deep insight into the dynamics of companies and markets with close collaboration at all levels of the client organization. This ensures that our clients achieve sustainable competitive advantage, build more capable organizations, and secure lasting results. Founded in 1963, BCG is a private company with 81 offices in 45 countries. For more information, please visit bcg.com.



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DOMINIC FIELD

DAVID DEAN

commissioned by



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PREFACE

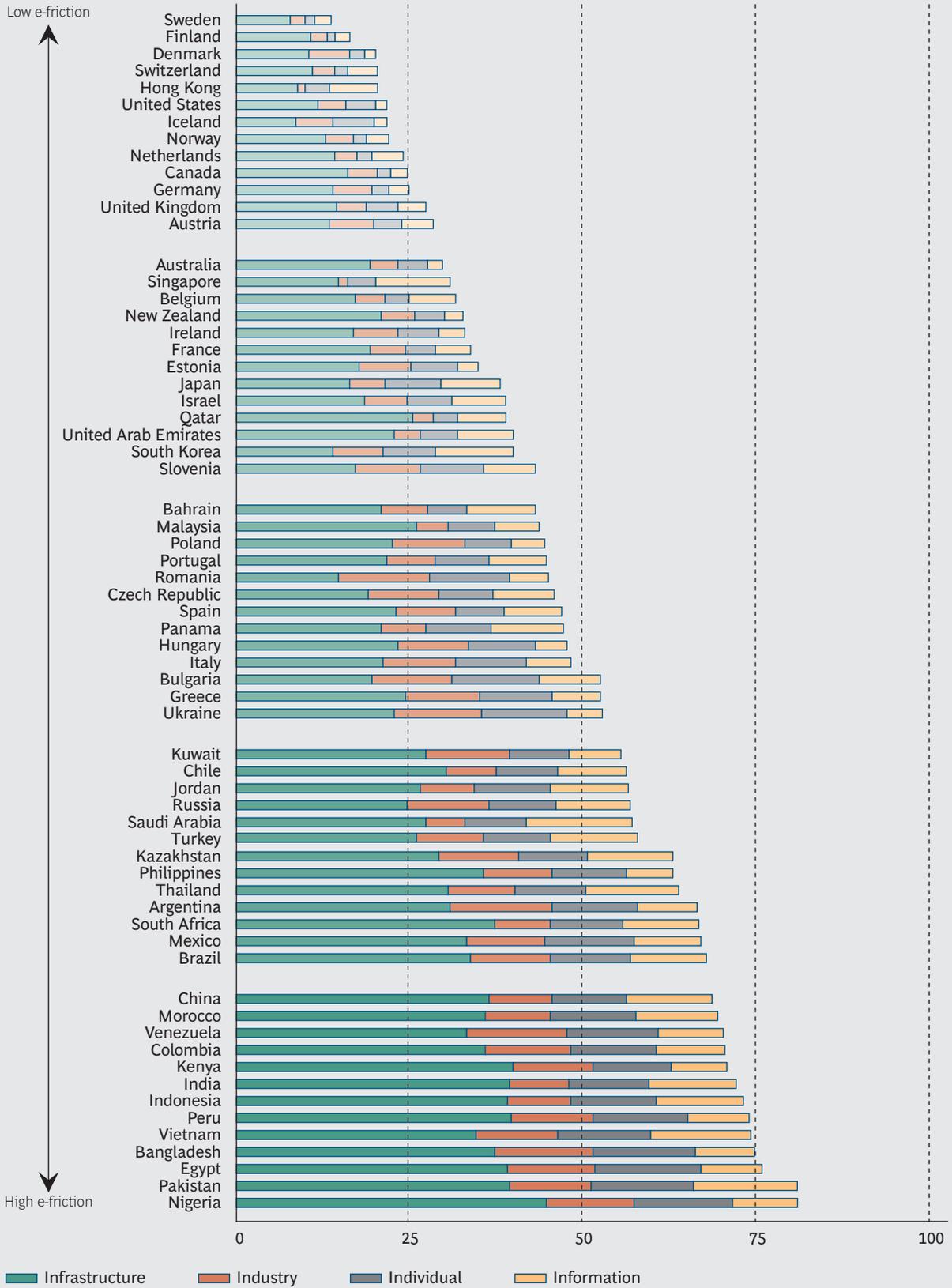
TO BETTER UNDERSTAND HOW various factors inhibit online interaction and exchange, and thereby constrain economic activity, the Internet Corporation for Assigned Names and Numbers (ICANN) commissioned The Boston Consulting Group to prepare an independent report, *Greasing the Wheels of the Internet Economy*. This supplement contains data for each of the economies included in the 2013 BCG e-Friction Index.

THE STATE OF E-FRICTION AROUND THE WORLD

MANY FACTORS CAN INHIBIT consumers, businesses, and others from fully participating in the Internet economy. The BCG e-Friction Index assesses the impact of 55 such factors on a country-by-country basis. We have grouped these indicators of friction into four components: infrastructure-related friction that limits basic Internet access, industry sources that affect the ability of

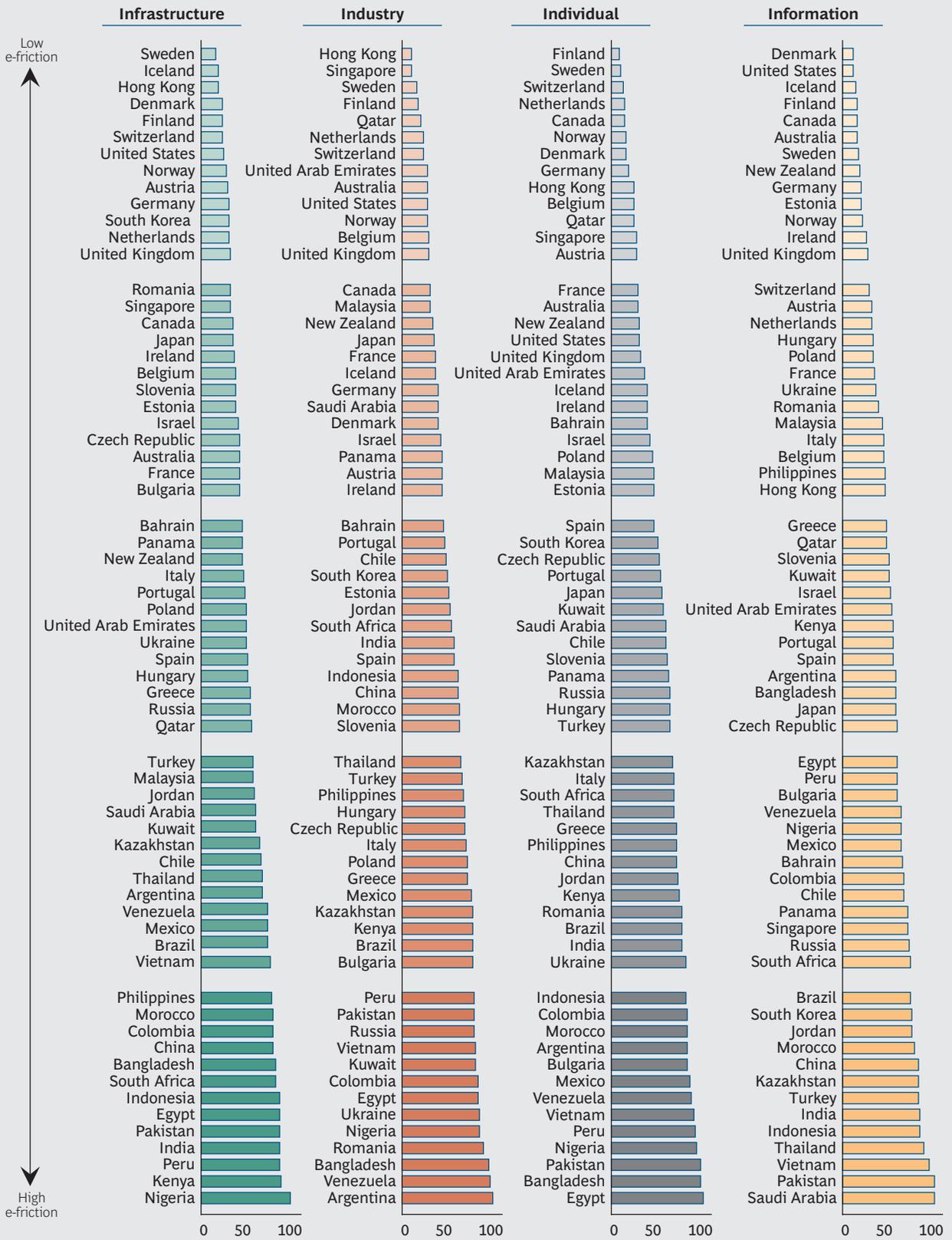
companies to maintain an Internet presence and engage in online transactions, individual sources that constrain consumer Internet activity, and information-related friction that involves the general availability of, and access to, online content. (See Exhibits 1, 2, and 3.)

EXHIBIT 1 | The BCG e-Friction Index



Source: BCG e-Friction Index model.

EXHIBIT 2 | Country Scores, by Component of e-Friction



Source: BCG e-Friction Index model.

EXHIBIT 3 | The Four Components of e-Friction Comprise 55 Indicators

| Infrastructure | Industry | Individual | Information |
|---|--|--|---|
| Access <ul style="list-style-type: none"> Internet bandwidth per capita (ITU) International Internet bandwidth per capita (TeleGeography) Consumer broadband penetration (%) (Pyramid Research) Business fixed-broadband penetration (%) (Pyramid Research) Mobile Internet subscription penetration (%) (Ovum) Number of IPv4 registrations per capita (BGP potaroo) Number of IPv6 registrations per capita (BGP potaroo) | Infrastructure <ul style="list-style-type: none"> Quality of transport infrastructure for physical fulfillment (0–7) (WEF) Quality of electricity and telephony infrastructure (0–7) (WEF) | Ability <ul style="list-style-type: none"> Quality of education system (0–7) (WEF) Adult literacy rate (%) (WEF) ICT skills (1–10) (WCC) | Sites <ul style="list-style-type: none"> Number of domains registered to each ccTLD per capita (Google) |
| | Labor <ul style="list-style-type: none"> ICT skills (1–10) (WCC) Quality of math and science education (0–7) (WEF) Availability of qualified engineers (0–7) (WEF) Capacity for innovation (0–7) (WEF) | Access <ul style="list-style-type: none"> Internet users (%) (World Bank) | Content <ul style="list-style-type: none"> Number of online open-encyclopedia pages in home language (Wikipedia¹) Number of micromessages made in home language (Twitter²) Share of population using social networks (%) (comScore) |
| Speed <ul style="list-style-type: none"> Peak fixed-broadband connection speed (Mbps) (Akamai) Average fixed-broadband connection speed (Mbps) (Akamai) Peak mobile-connection speed (Mbps) (Akamai) Average mobile-connection speed (Mbps) (Akamai) | Capital <ul style="list-style-type: none"> Financial-market sophistication (0–7) (WEF) Financing through local equity market (0–7) (WEF) Ease of access to loans (0–7) (WEF) Foreign direct-investment-to-GDP ratio (WEF) Venture capital availability (0–7) (WEF) | Banking <ul style="list-style-type: none"> Availability of financial services (0–7) (WEF) Affordability of financial services (0–7) (WEF) Market penetration of bank accounts (%) (WEF) | Data <ul style="list-style-type: none"> Commitment to open data (0–1) (Open Knowledge Foundation) |
| Price <ul style="list-style-type: none"> Fixed-broadband pricing (\$ per month at PPP) (WEF) Mobile pricing (\$ per minute local call off-net [peak] at PPP) (WCC) | Economy <ul style="list-style-type: none"> Strength of intellectual property protection (0–7) (WEF) Burden of customs procedures (0–7) (WEF) Prevalence of trade barriers (0–7) (WEF) Number of days to set up a business (WEF) | Payments <ul style="list-style-type: none"> Population using online personal finance (%) (comScore) Debit card penetration (%) (WEF) | Objectivity <ul style="list-style-type: none"> Press Freedom Index (0–100) (Reporters Without Borders) Freedom on the Net (0–100) (Freedom House) |
| Traffic <ul style="list-style-type: none"> Traffic volumes per capita (Mbps) (Cisco) International traffic volumes per capita (Mbps) (TeleGeography) | | | |
| Architecture <ul style="list-style-type: none"> Exchange points per capita (Euro-IX) Number of networks (ASNs) per capita (BGP potaroo) Content registered to ccTLD hosted onshore (%) (Pingdom) Existence of independent regulator (0–1 score) (ITU, BCG) | Technology <ul style="list-style-type: none"> Company-level technology absorption (0–7) (WEF) | Trust <ul style="list-style-type: none"> Cyber security being adequately addressed (1–10) (WCC) Trust in privacy of credit card and other financial data (survey score) (BCG) Trust in privacy of other personal data (survey score) (BCG) | Obstacles <ul style="list-style-type: none"> Filtering score (1–15) (OpenNet Initiative) |

Source: BCG e-Friction Index model.

Note: ITU = International Telecommunication Union; IPv4 = Internet Protocol version 4; BGP = Border Gateway Protocol; IPv6 = Internet Protocol version 6; Mbps = megabits per second; PPP = purchasing power parity; WEF = World Economic Forum; WCC = World Competitiveness Center; Euro-IX = European Internet Exchange Association; ASN = autonomous system number; ccTLD = country code top-level domain; ICT = information and communications technology.

¹For China, the number of entries on Hudong and Baidu Baike was used.

²For China, the number of messages posted to Sina Weibo and Tencent Weibo per day was used.

A COUNTRY-BY-COUNTRY E-FRICTION ANALYSIS

THE BCG E-FRICTION INDEX rates countries on a scale of 0 to 100. No economy is entirely frictionless, of course, and sources of friction evolve over time, but a hypothetical country that comes out on top on all 55 friction indicators in our index today would score 0—or no e-friction. A country that ranks last across the board would score 100. We scored actual countries against these baselines.

The 55 indicators are interrelated and work together to determine the overall friction affecting the digital economy of a particular

country. Each country can gain an understanding of how it compares with neighbors and competitors by assessing its rankings across the different types of friction. It can thus determine where its efforts to eliminate sources of friction are best aimed.

The exhibits on the following pages provide the details of each country's e-friction score.

Argentina

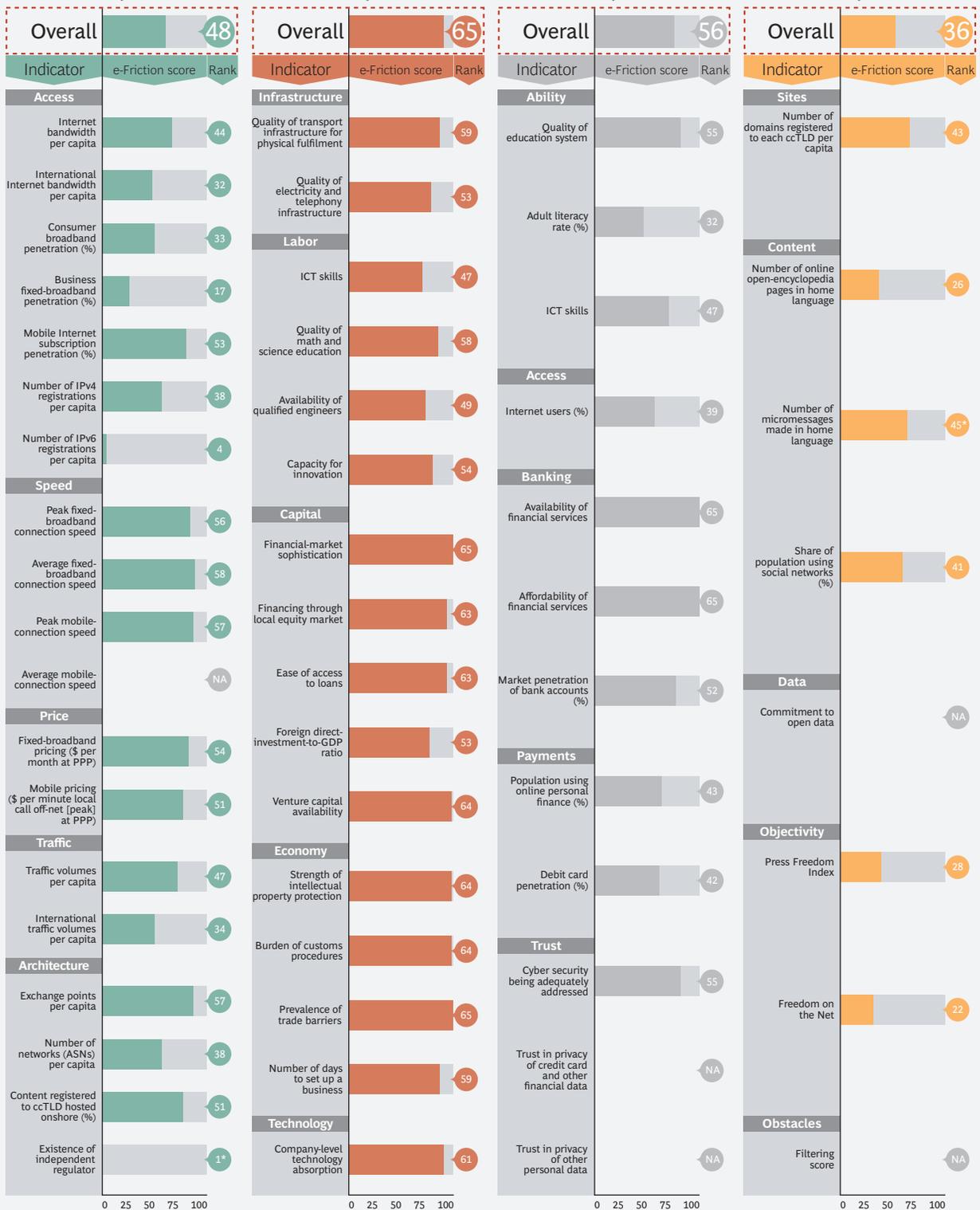
e-Friction Score: 67
Rank: 49 

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Source: BCG e-Friction Index model.

Note: IPv4 = Internet Protocol version 4; IPv6 = Internet Protocol version 6; PPP = purchasing power parity; ASN = autonomous system number; ccTLD = country code top-level domain; ICT = information and communications technology; * = discrete scale, with several countries having an equal ranking; NA = not available. For definitions and source information for each indicator, please see Exhibit 3.

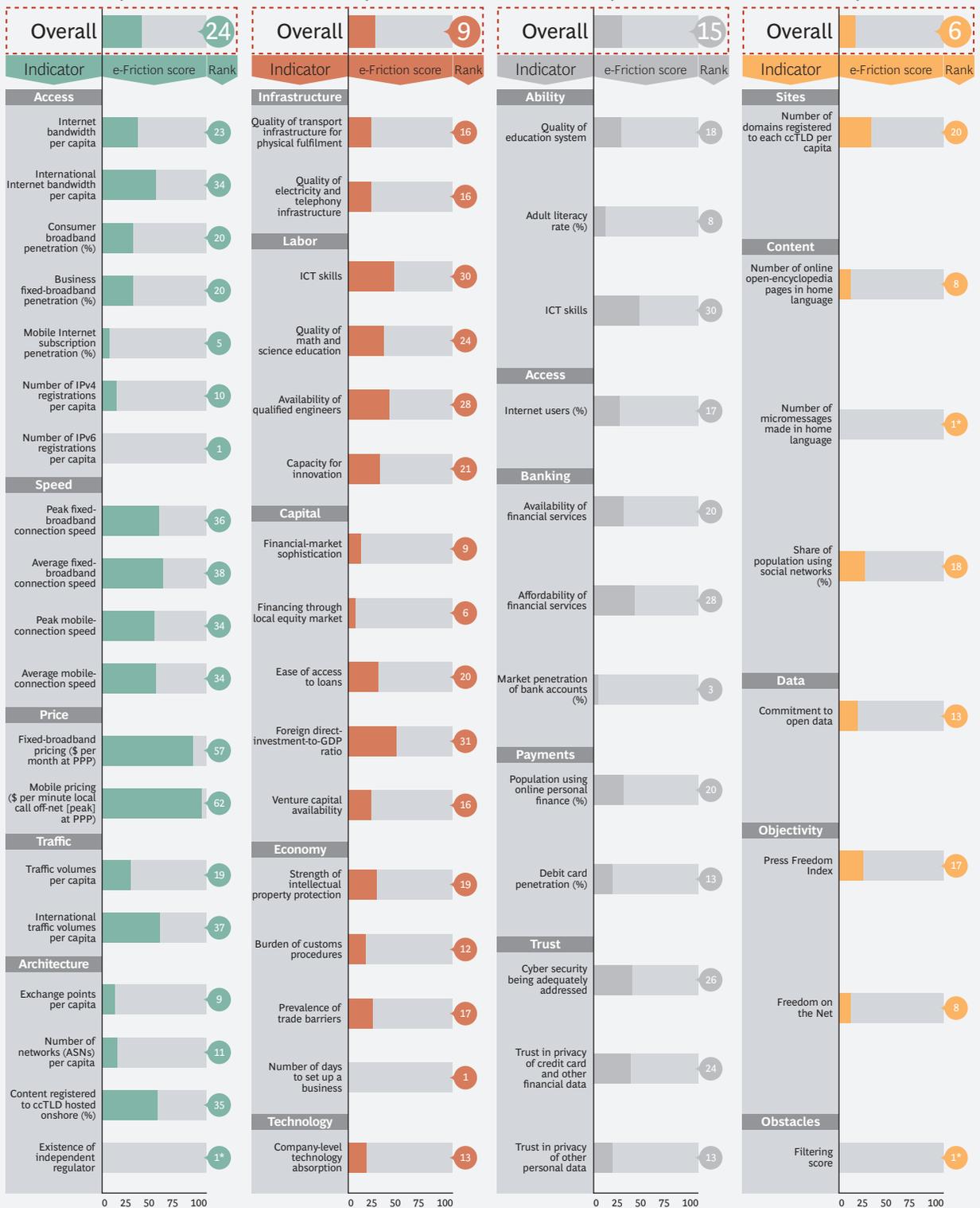


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Austria

e-Friction Score: 29
Rank: 13

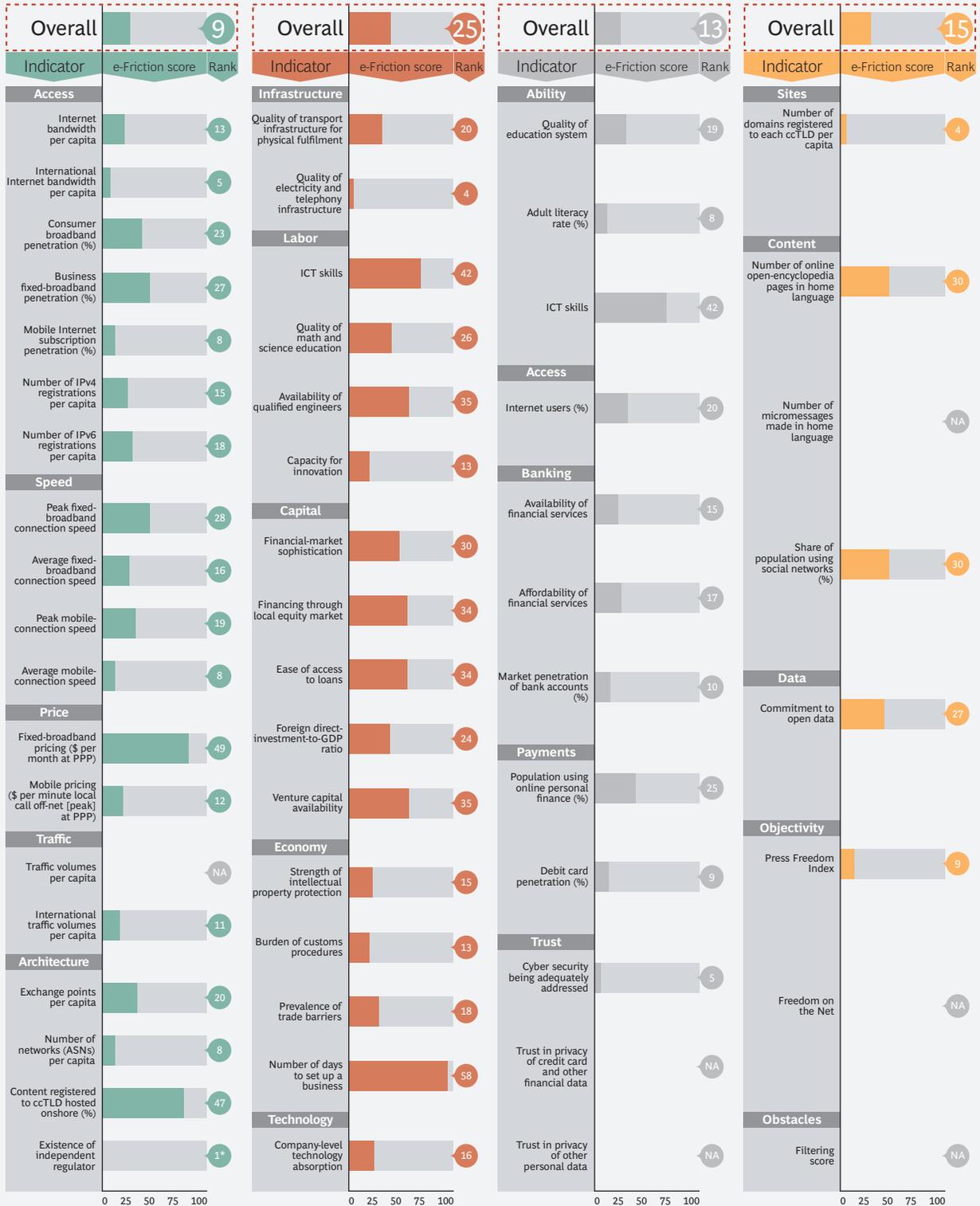


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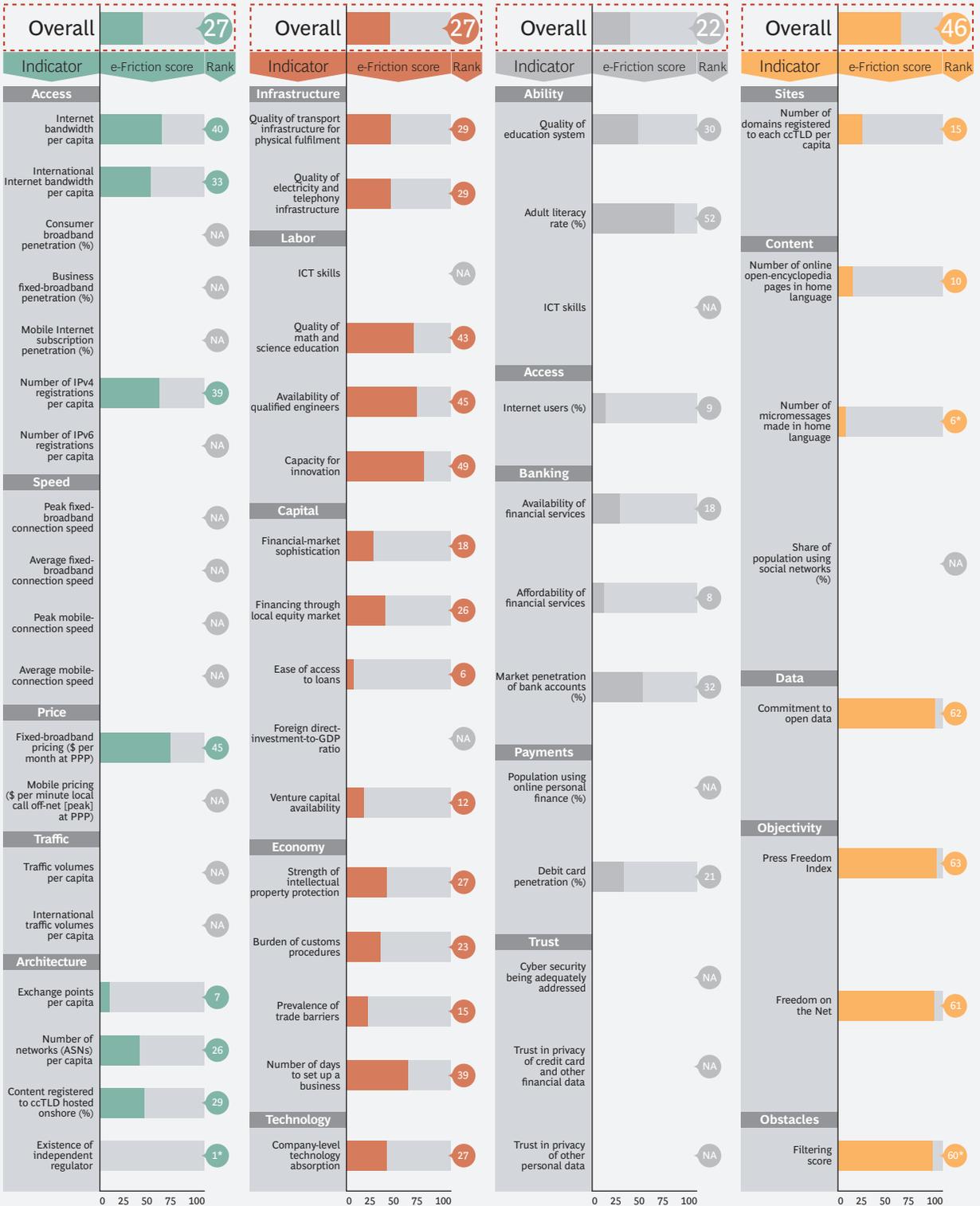


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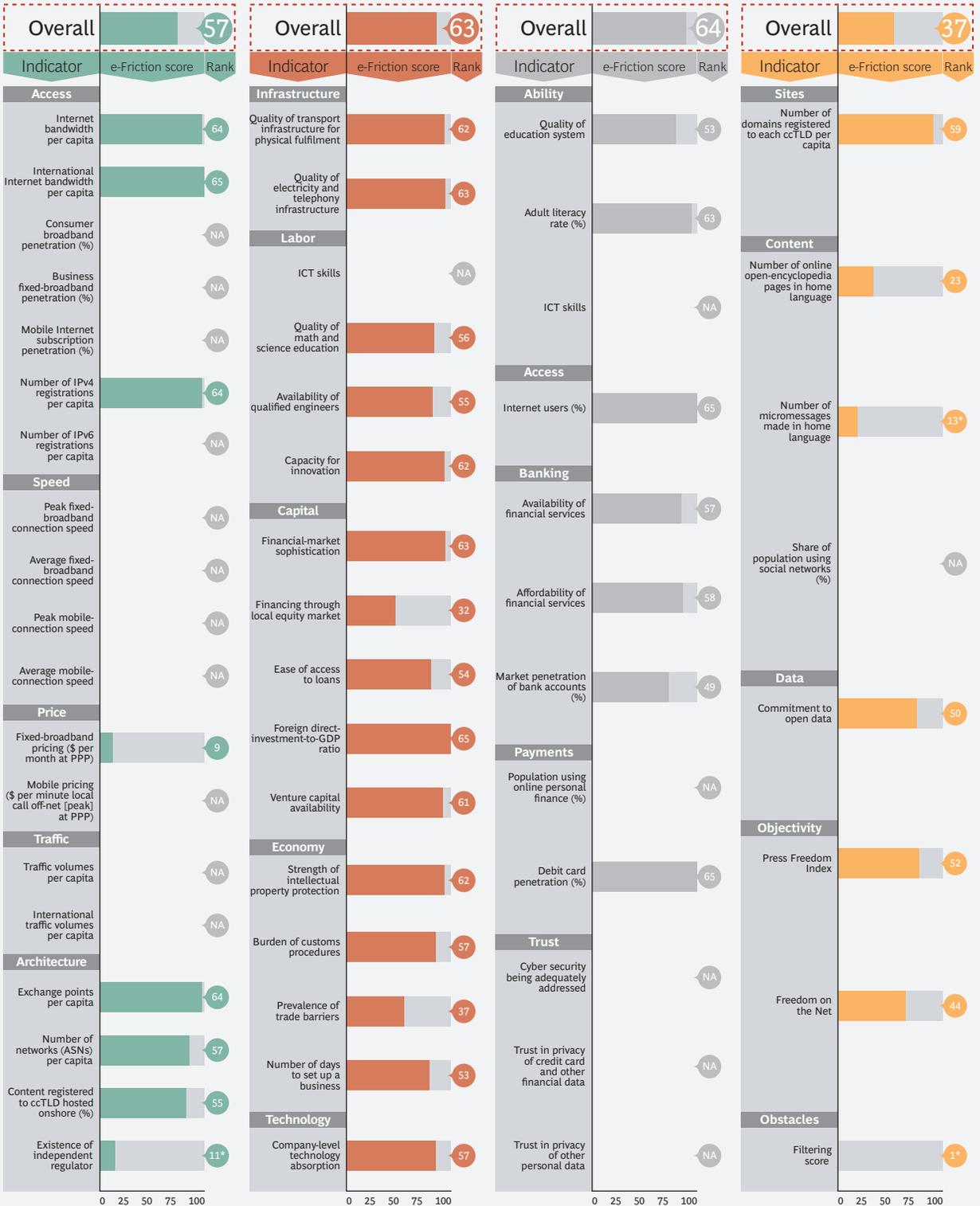


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Belgium

e-Friction Score: 32
Rank: 16

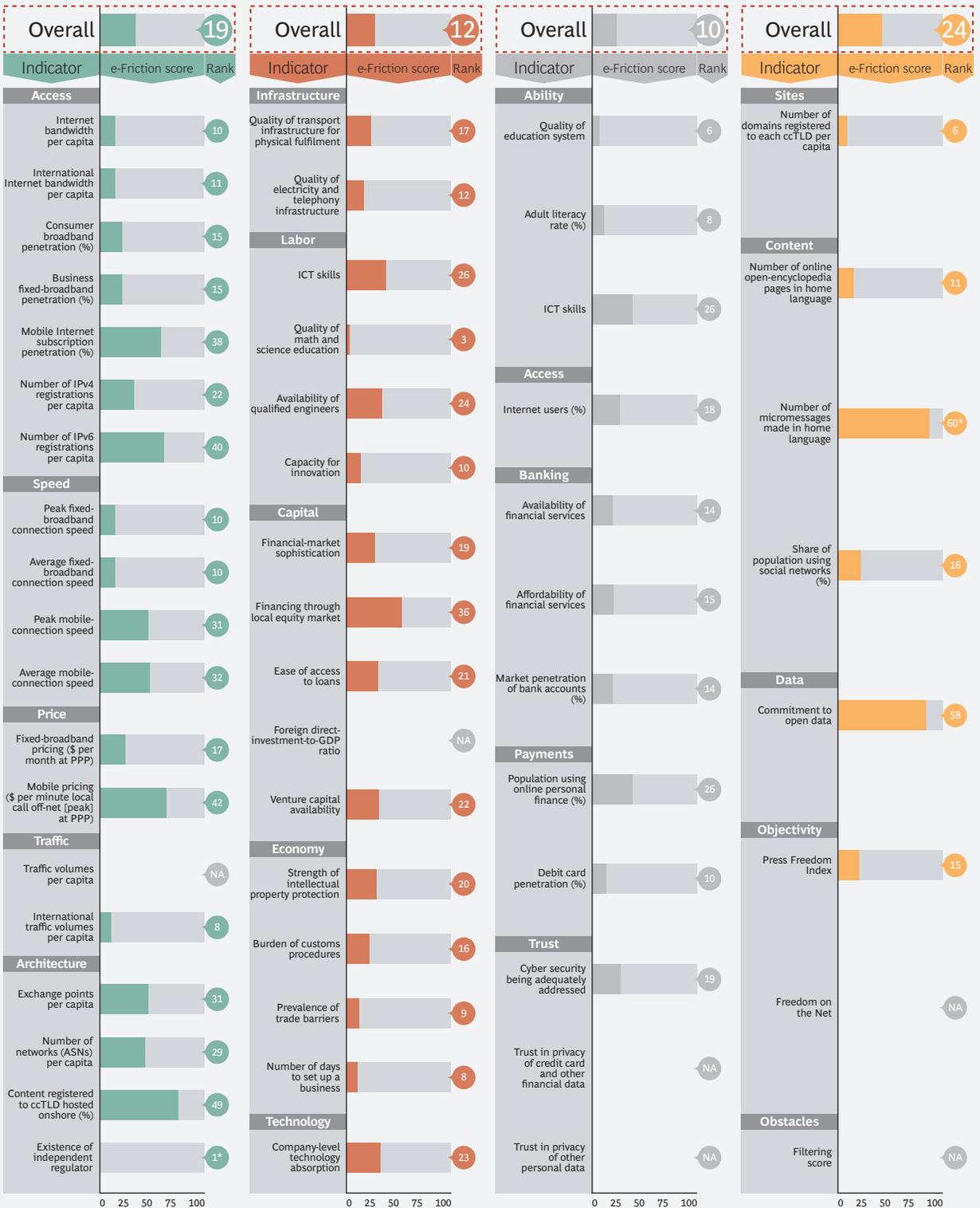


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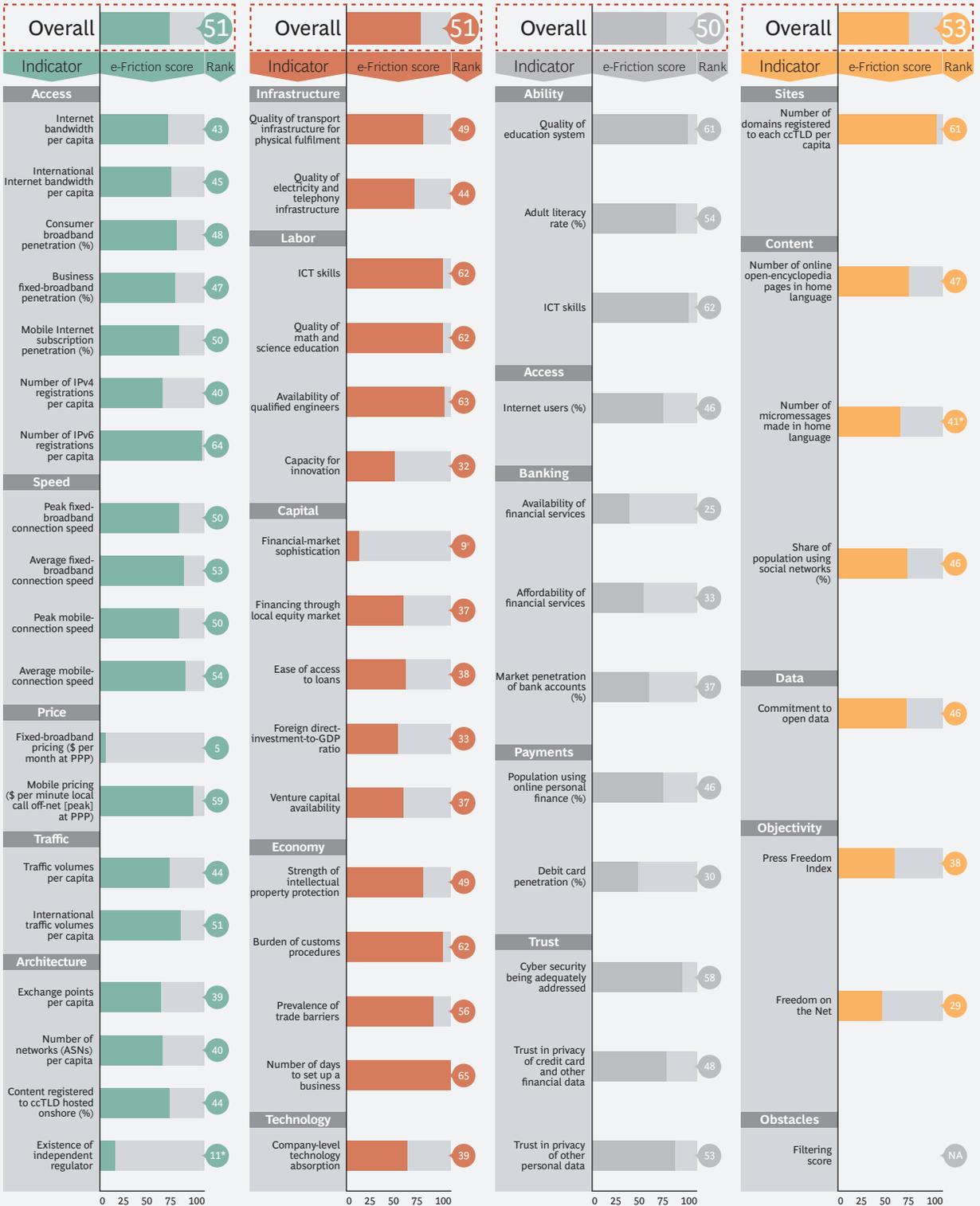


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Bulgaria

e-Friction Score: 53
Rank: 37

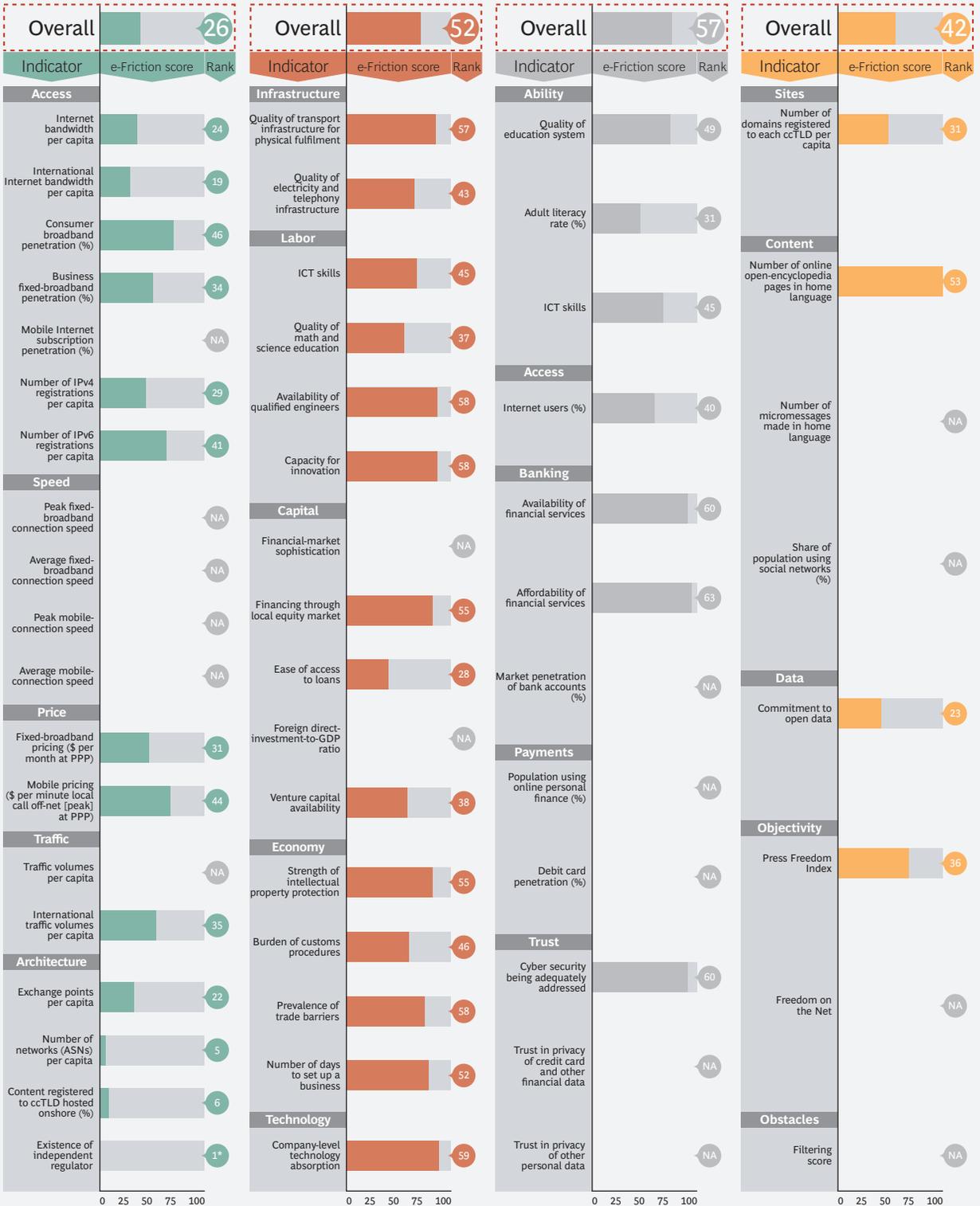


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Source: BCG e-Friction Index model.

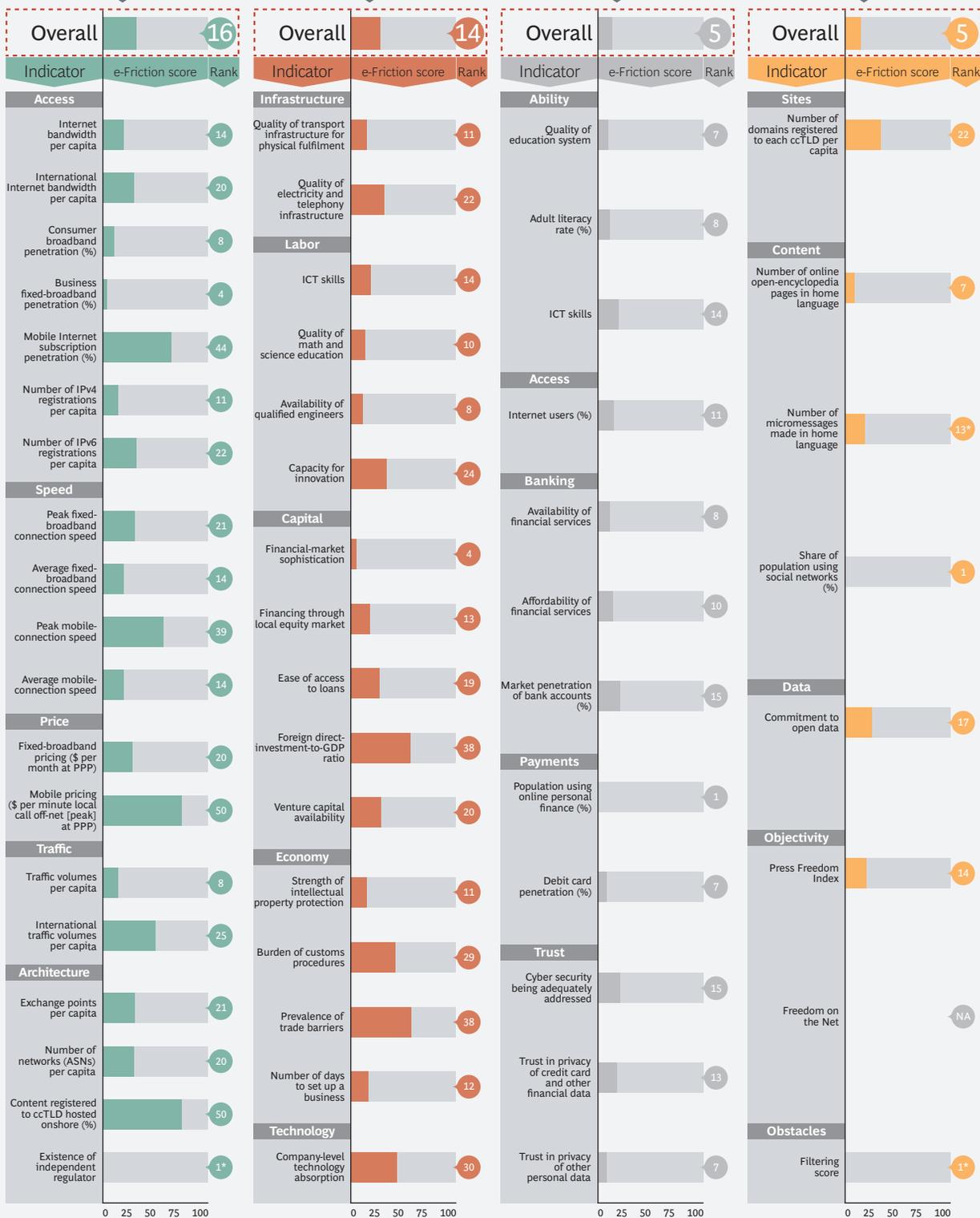
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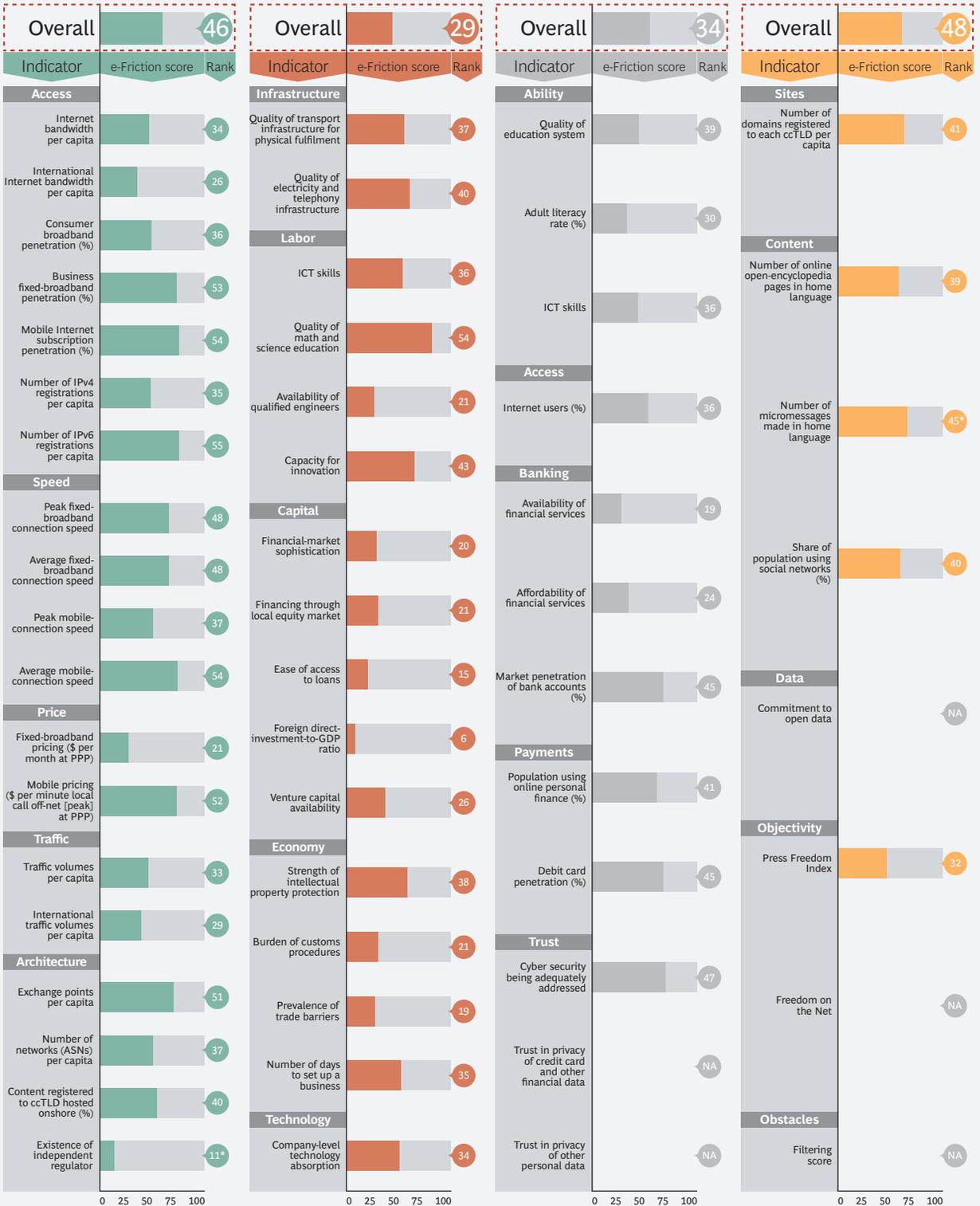


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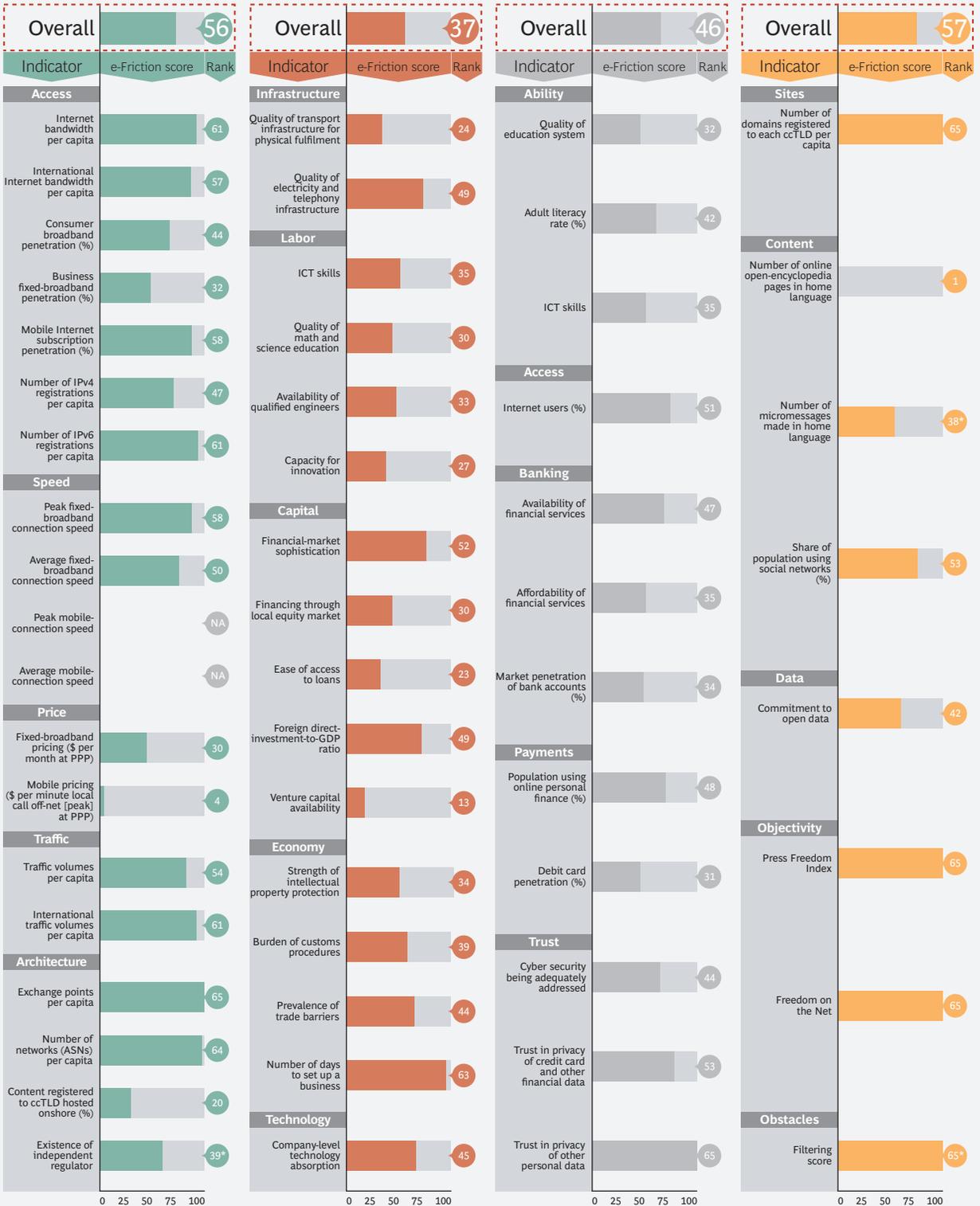


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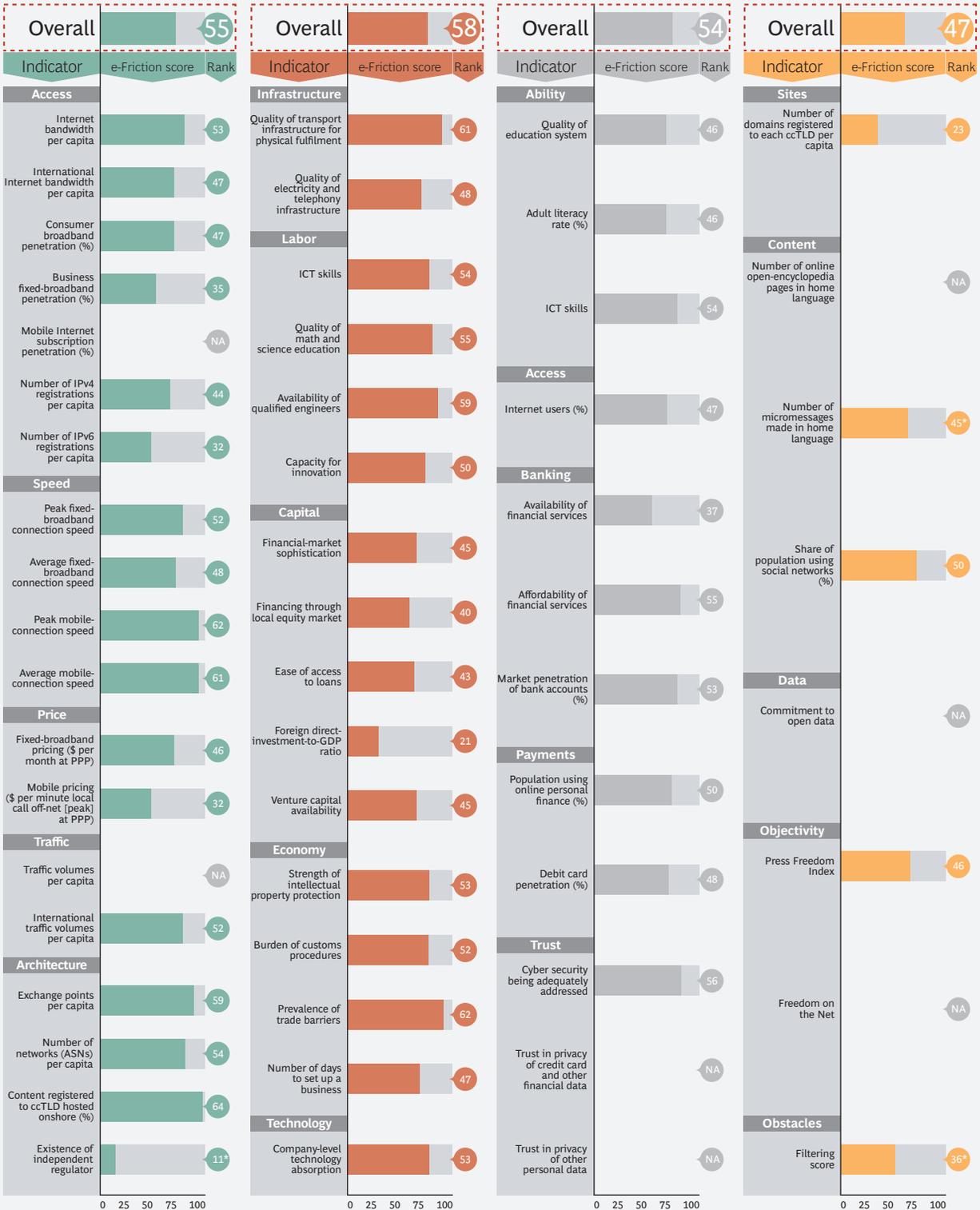


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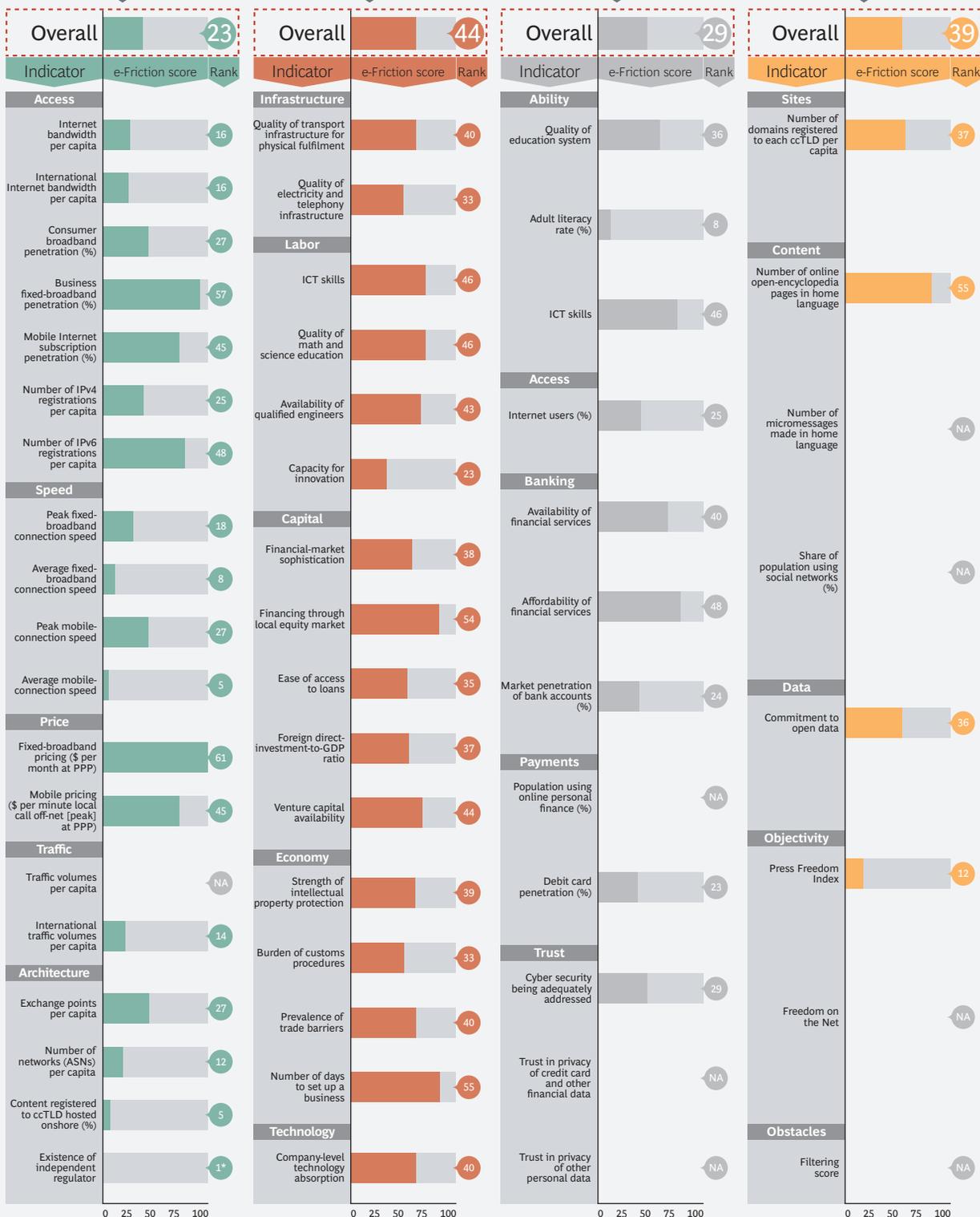


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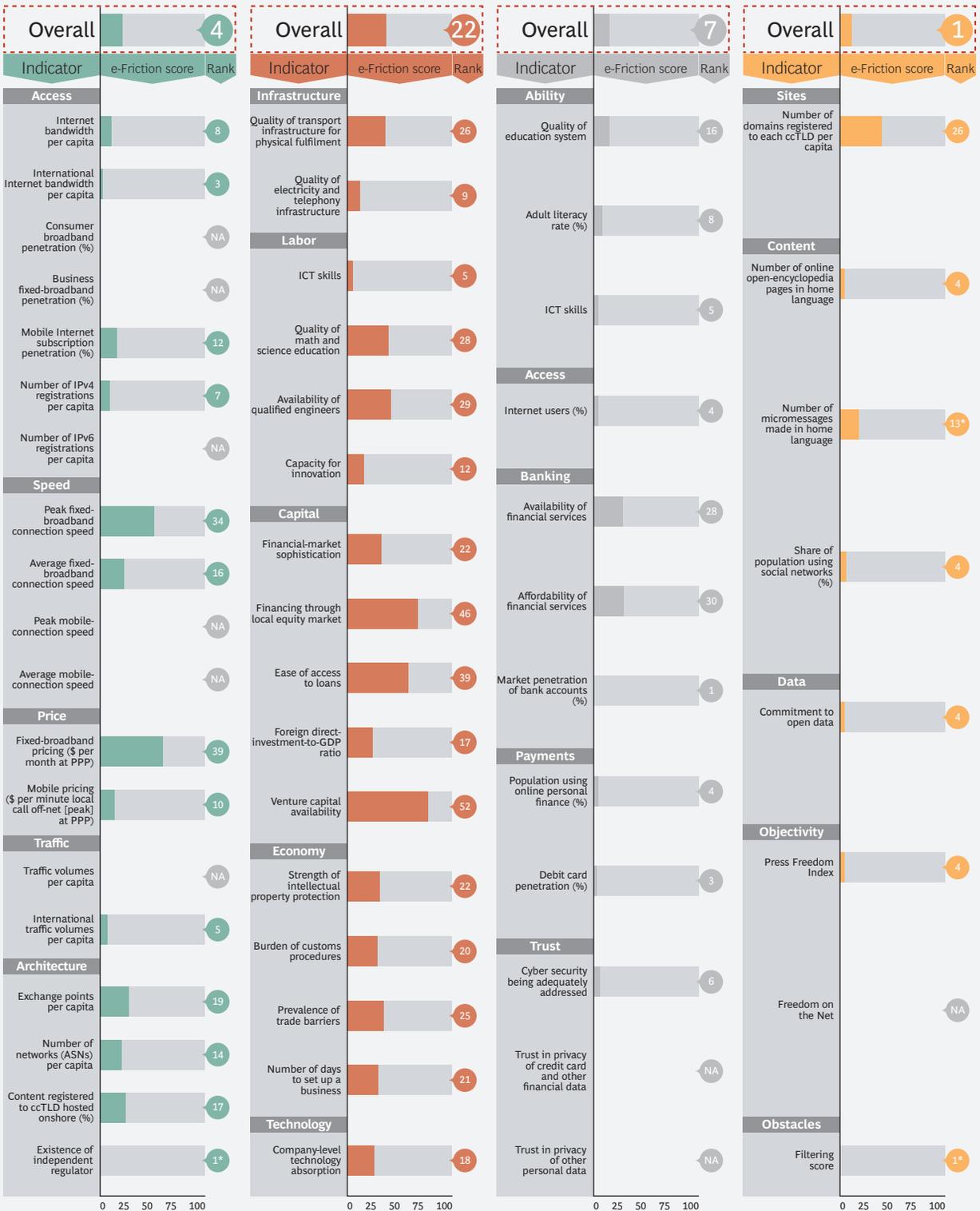
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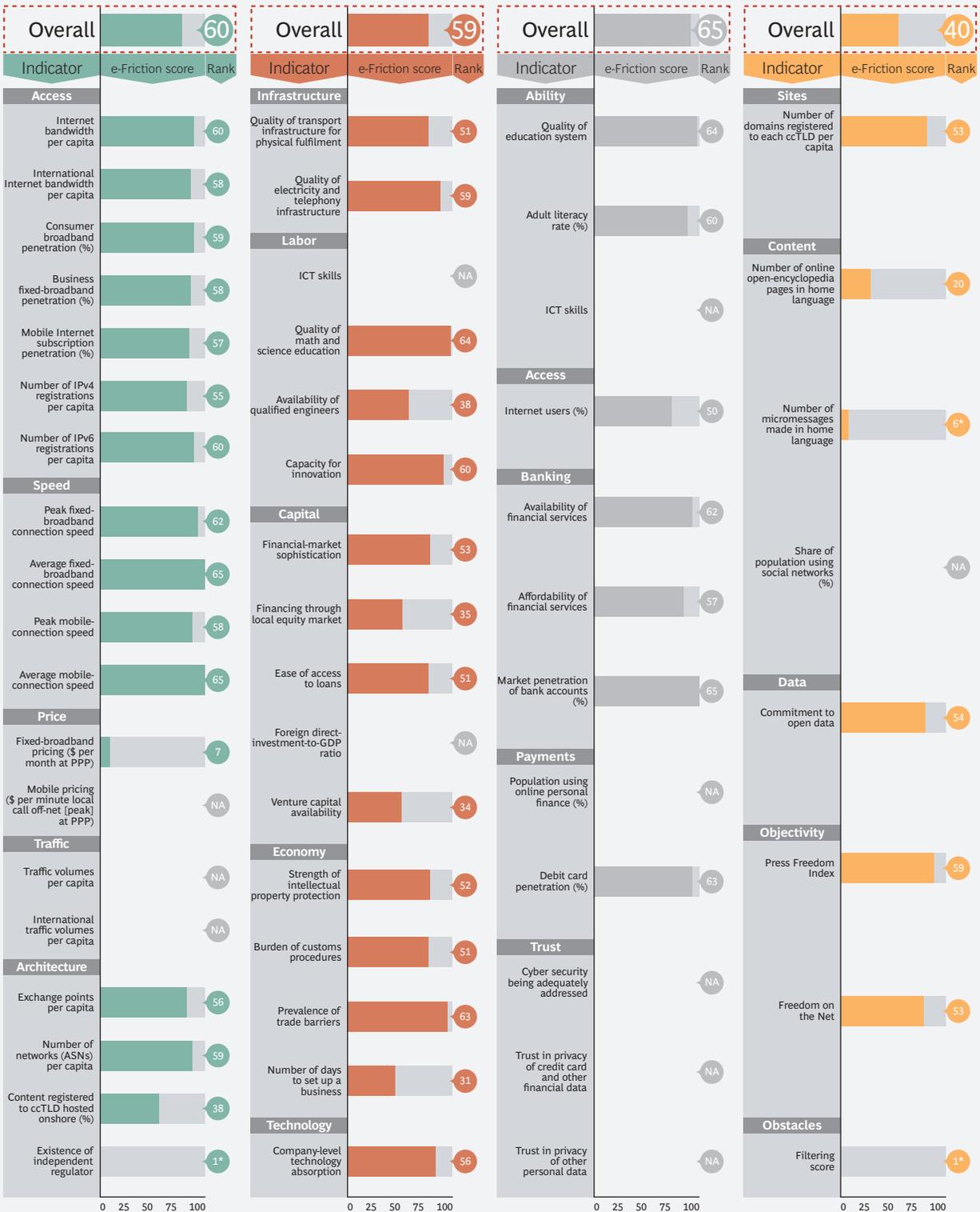


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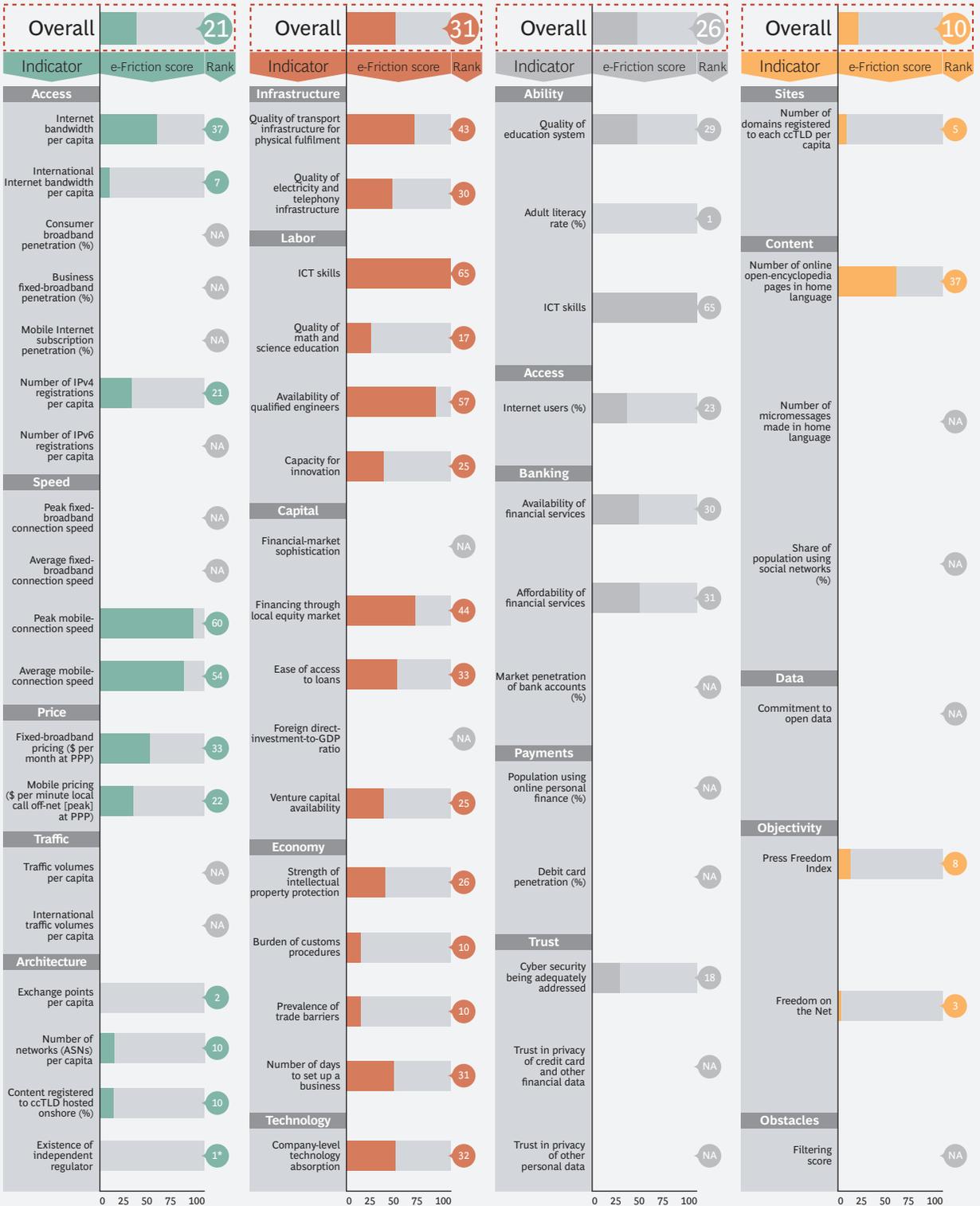
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Finland

e-Friction Score: 17
Rank: 2

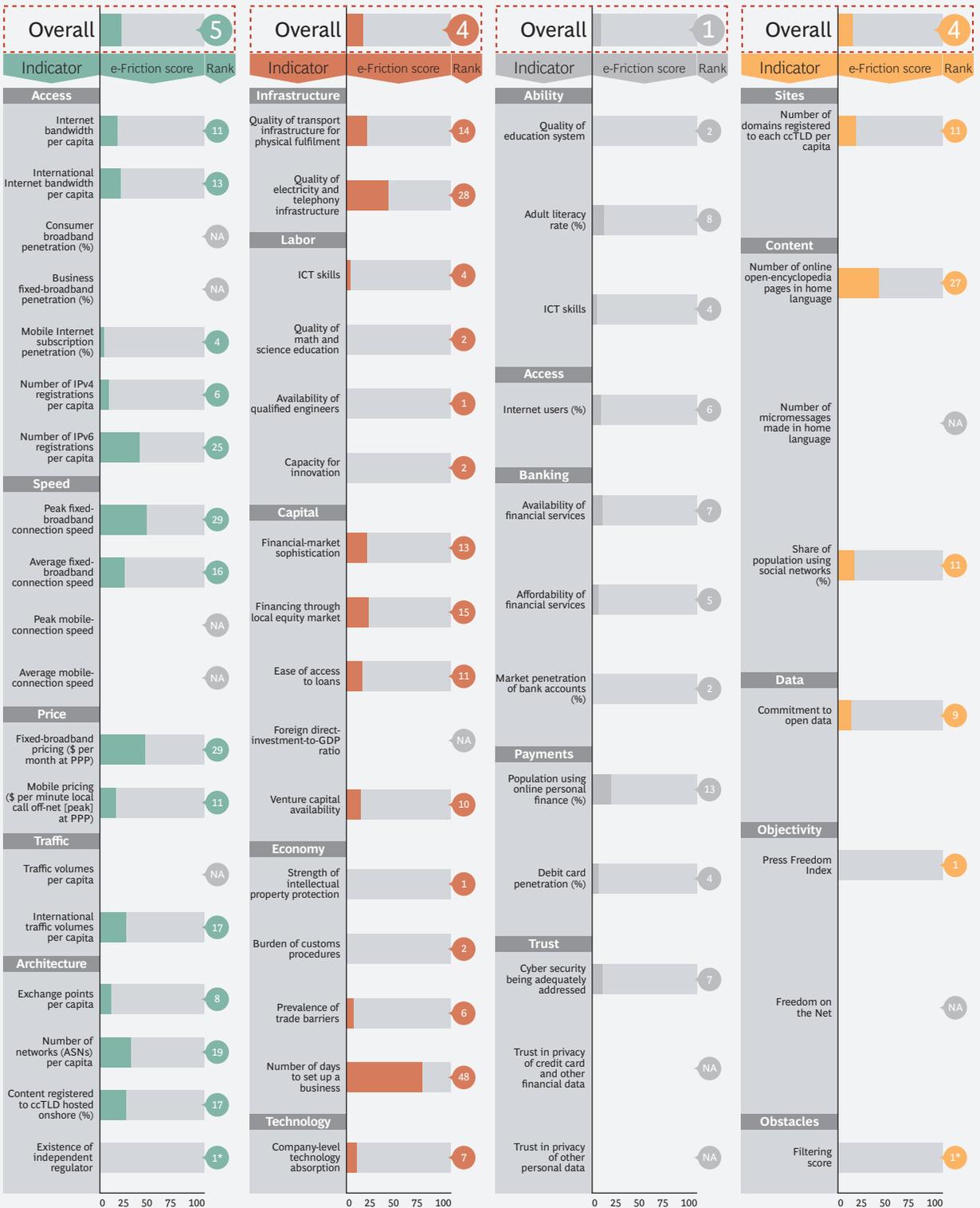


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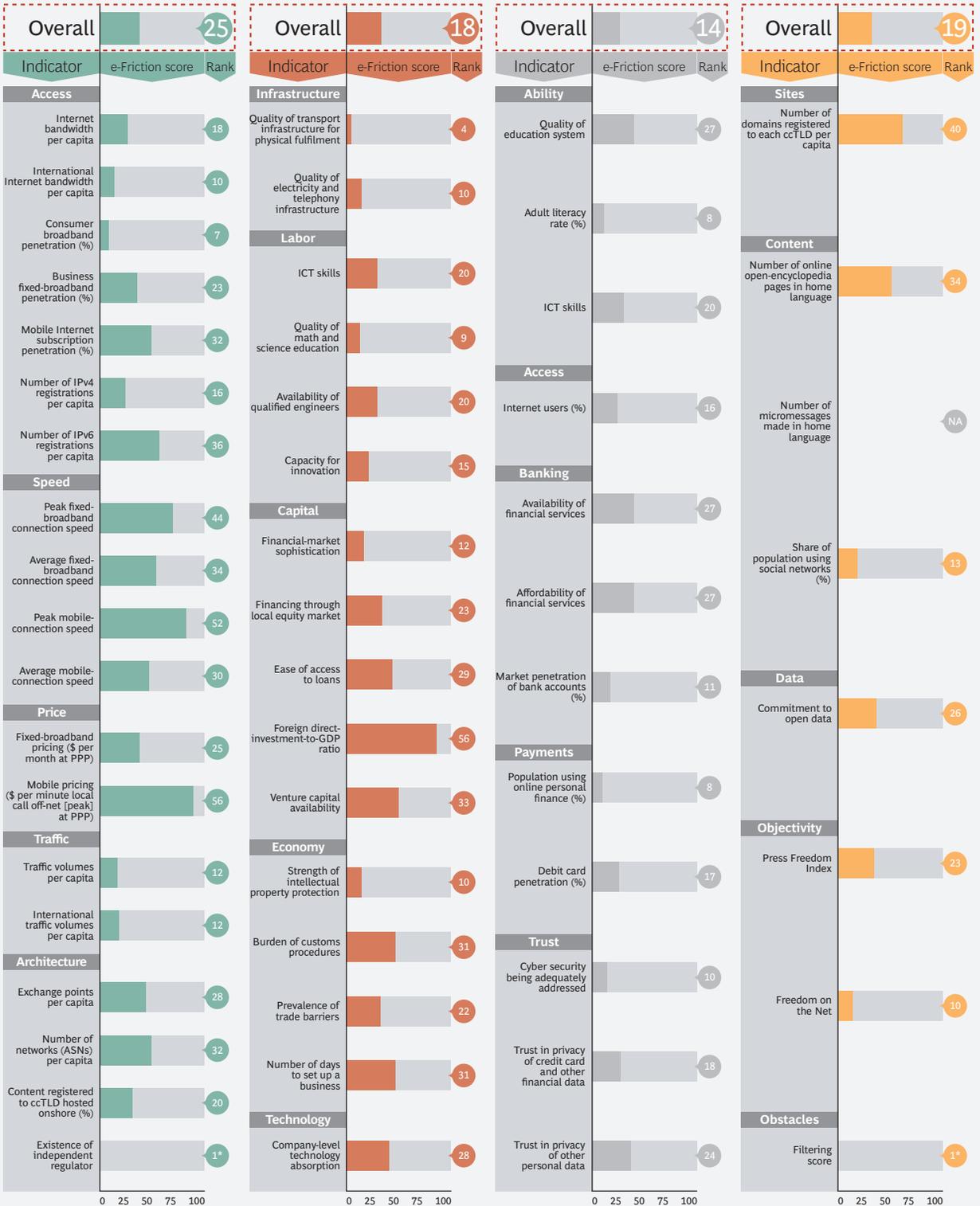
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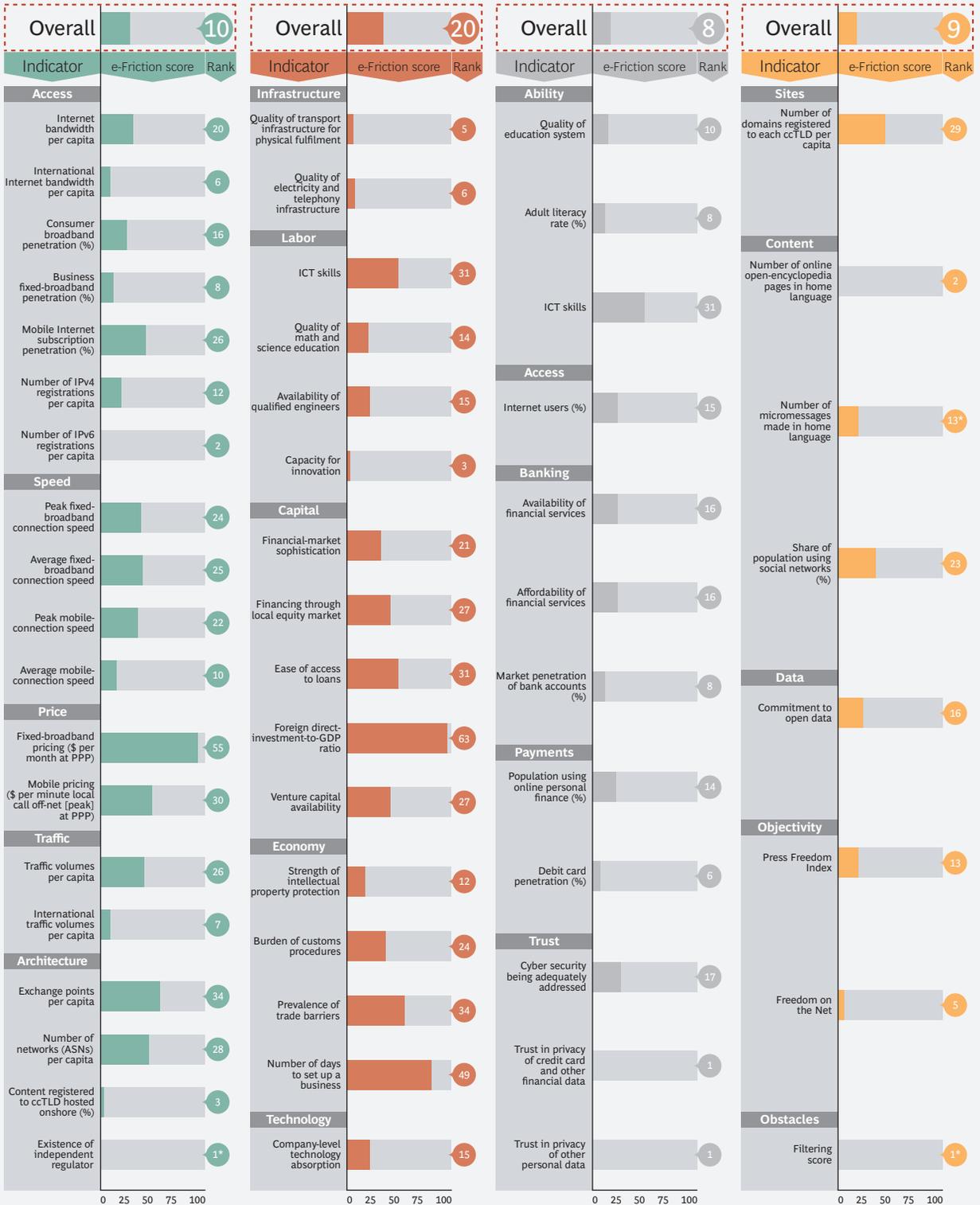
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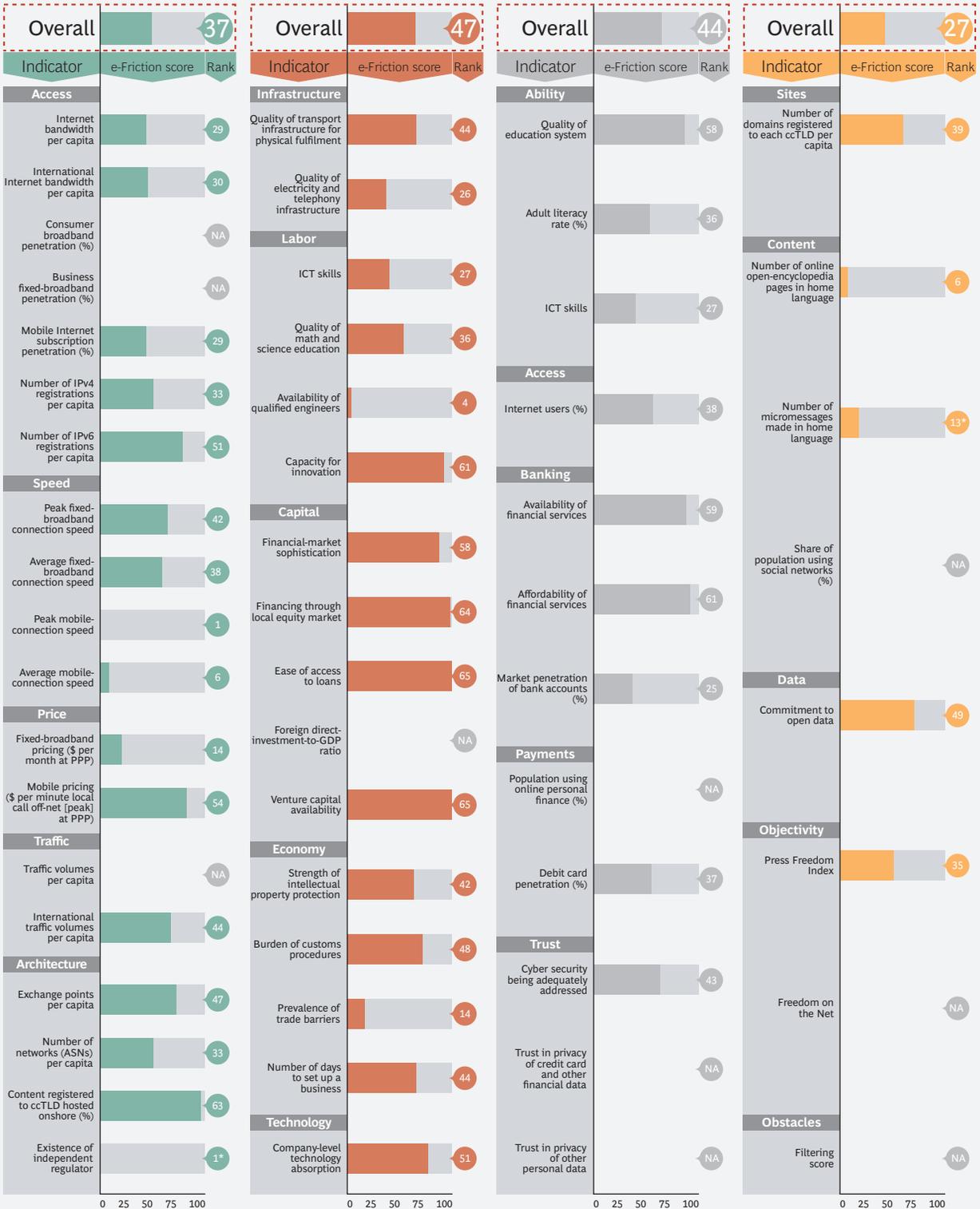


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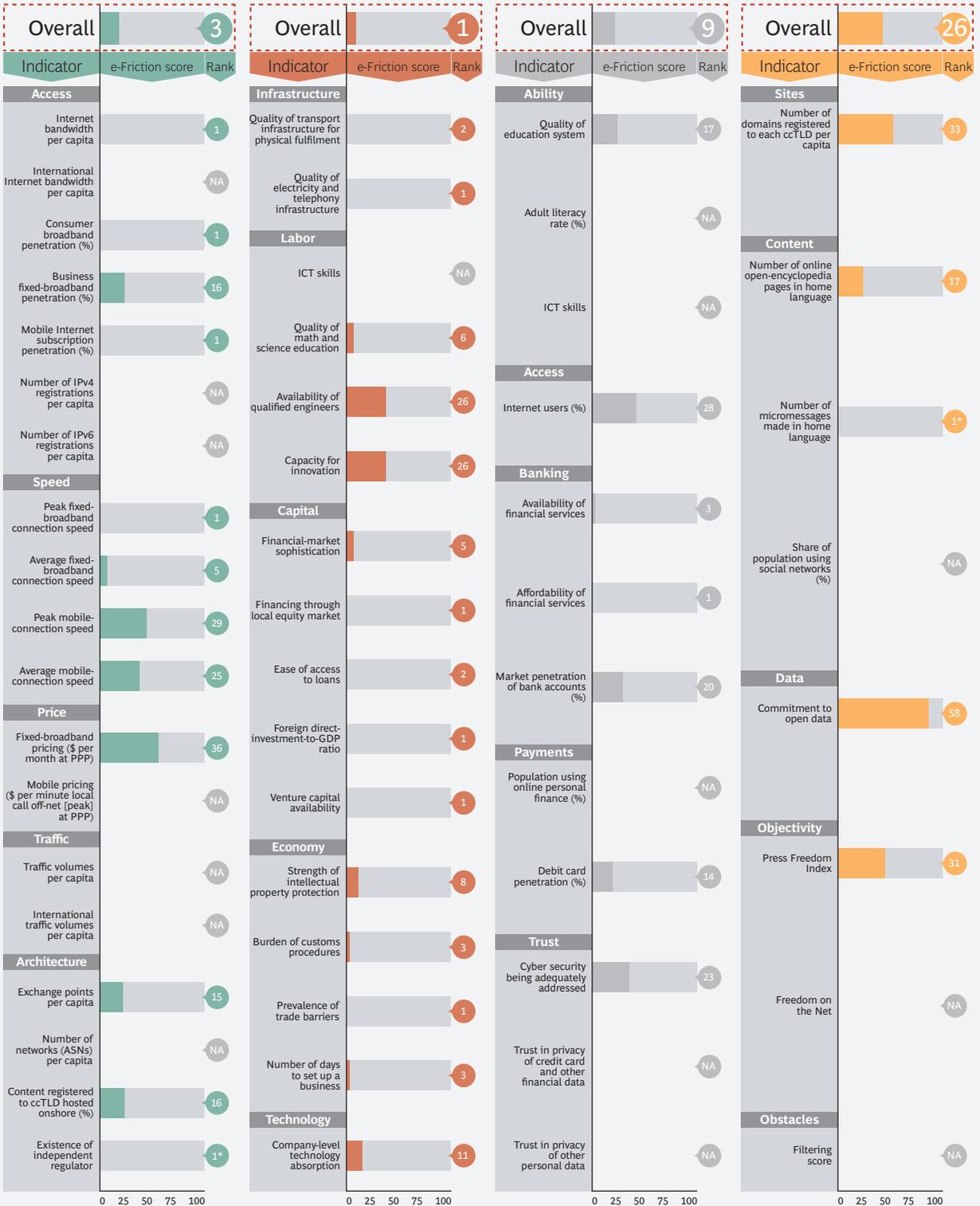


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Hungary

e-Friction Score: 48
Rank: 35

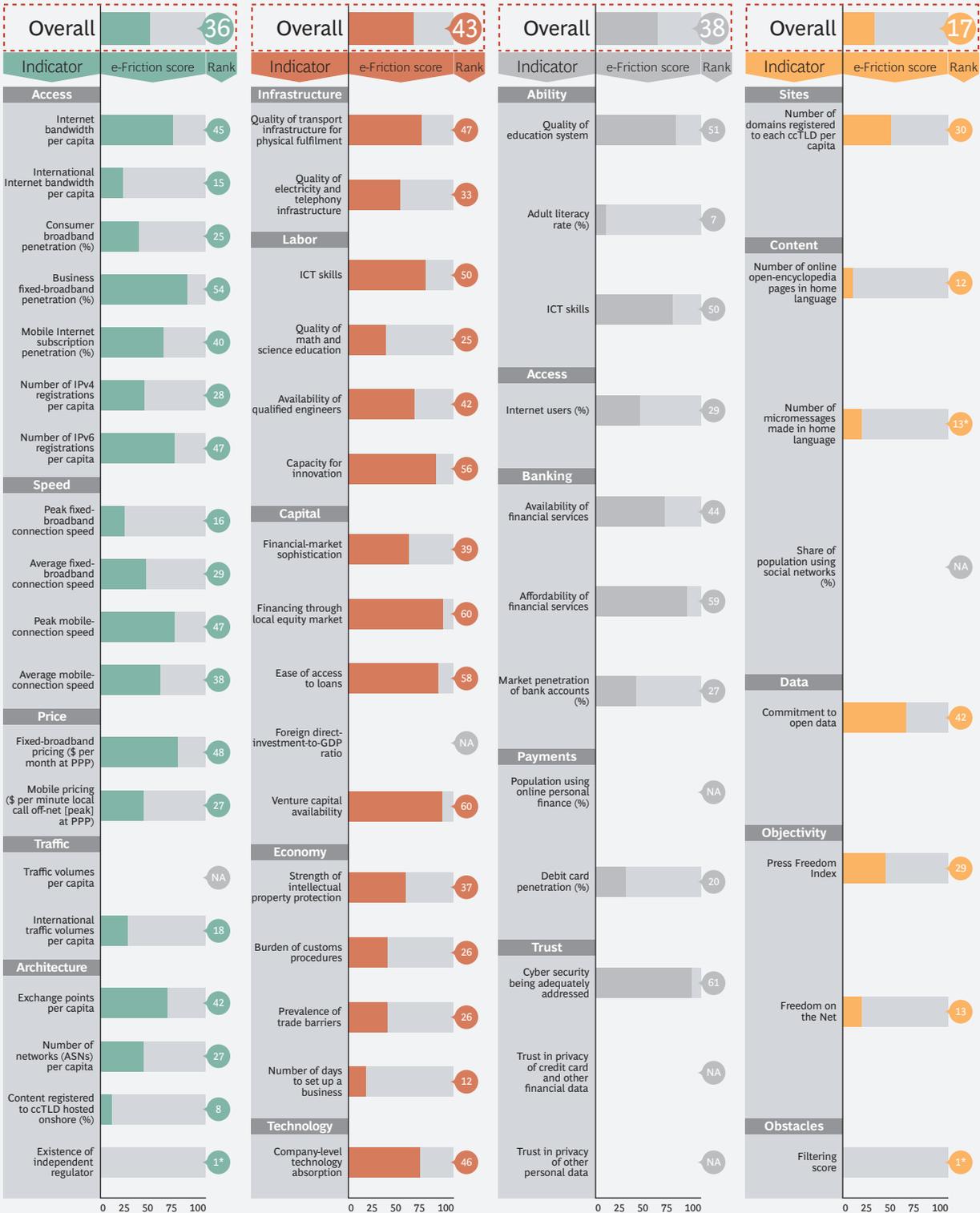


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Iceland

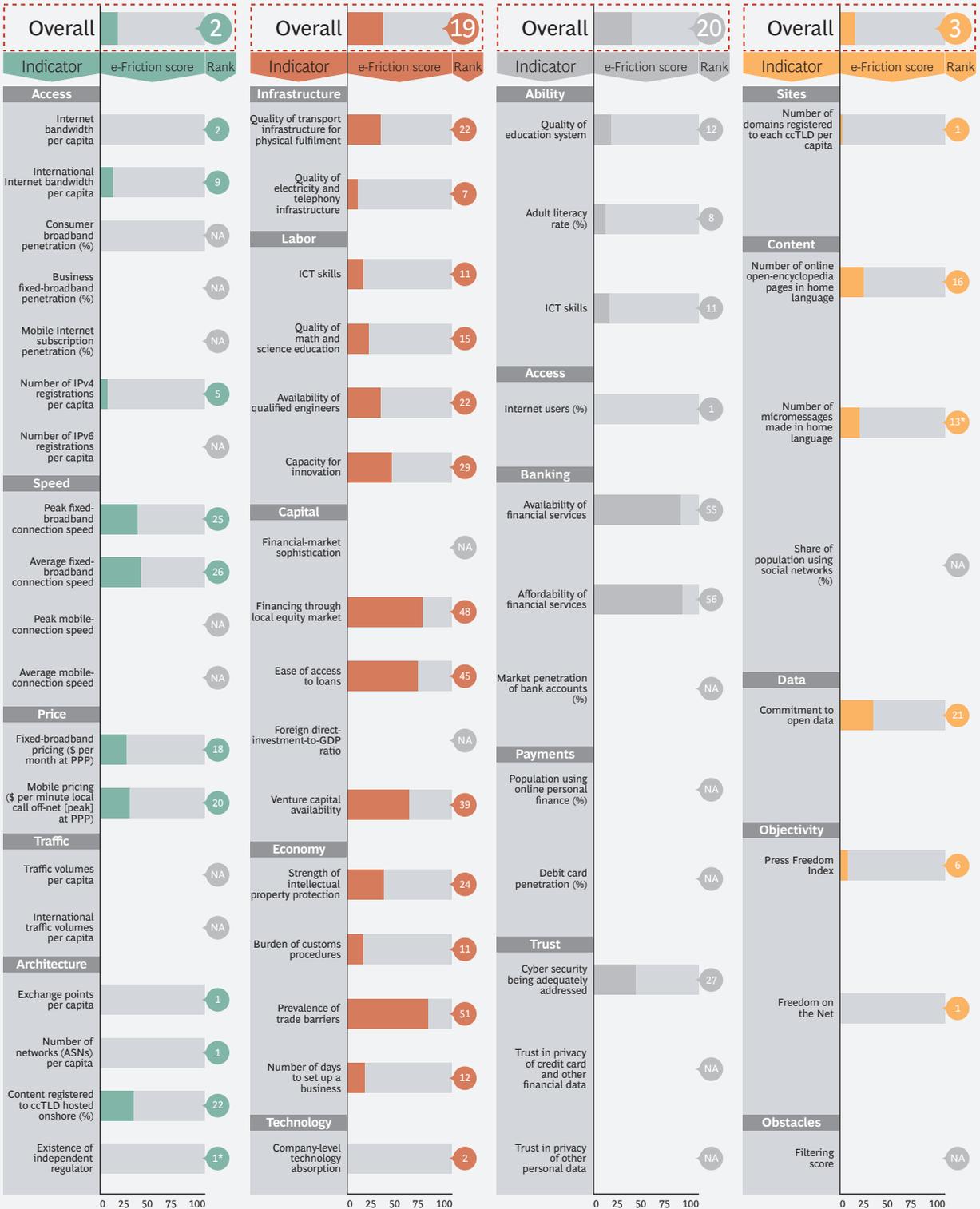
e-Friction Score: 22
Rank: 7 

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India

e-Friction Score: 73
Rank: 58

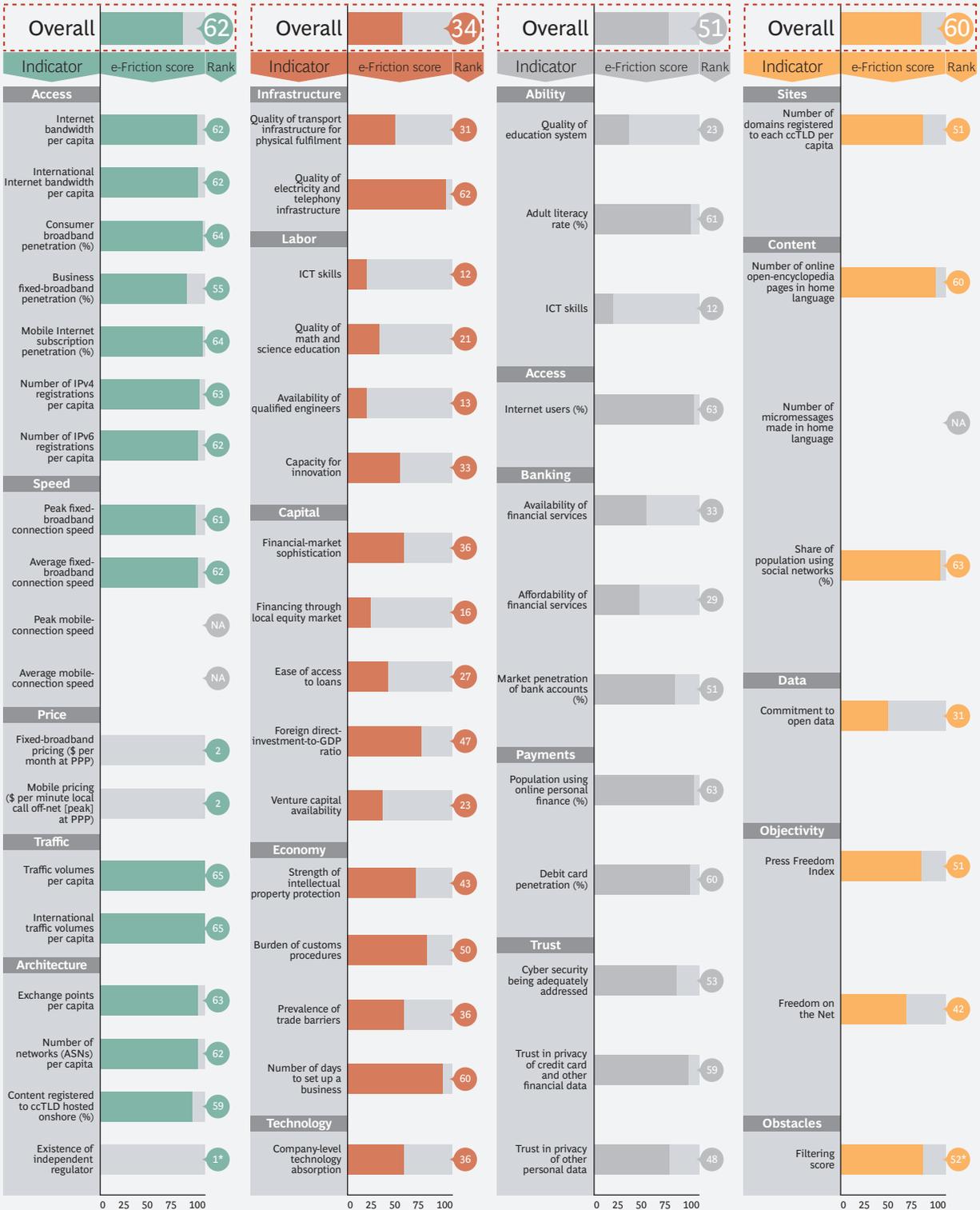


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Indonesia

e-Friction Score: 74
Rank: 59

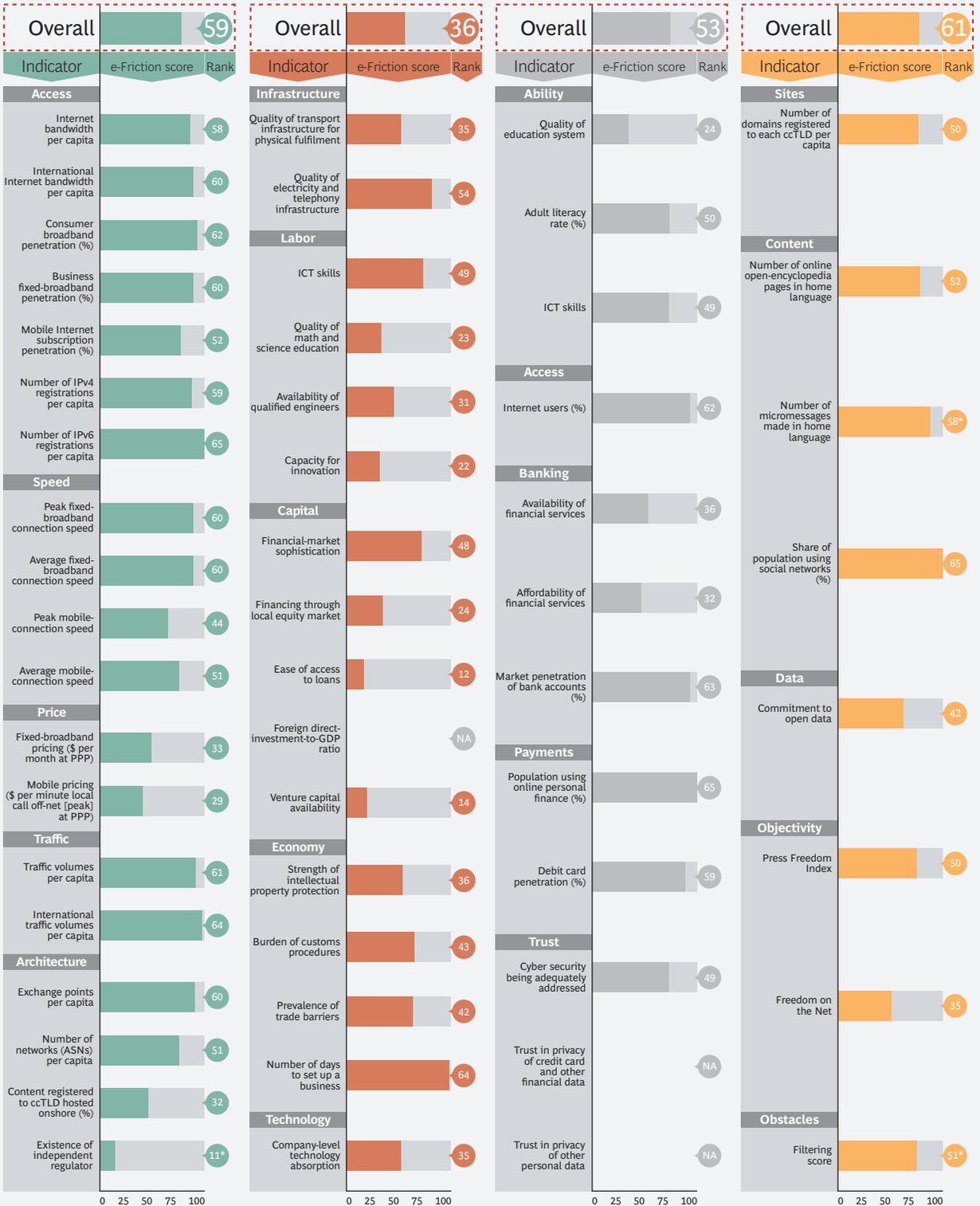


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Ireland

e-Friction Score: 34
Rank: 18

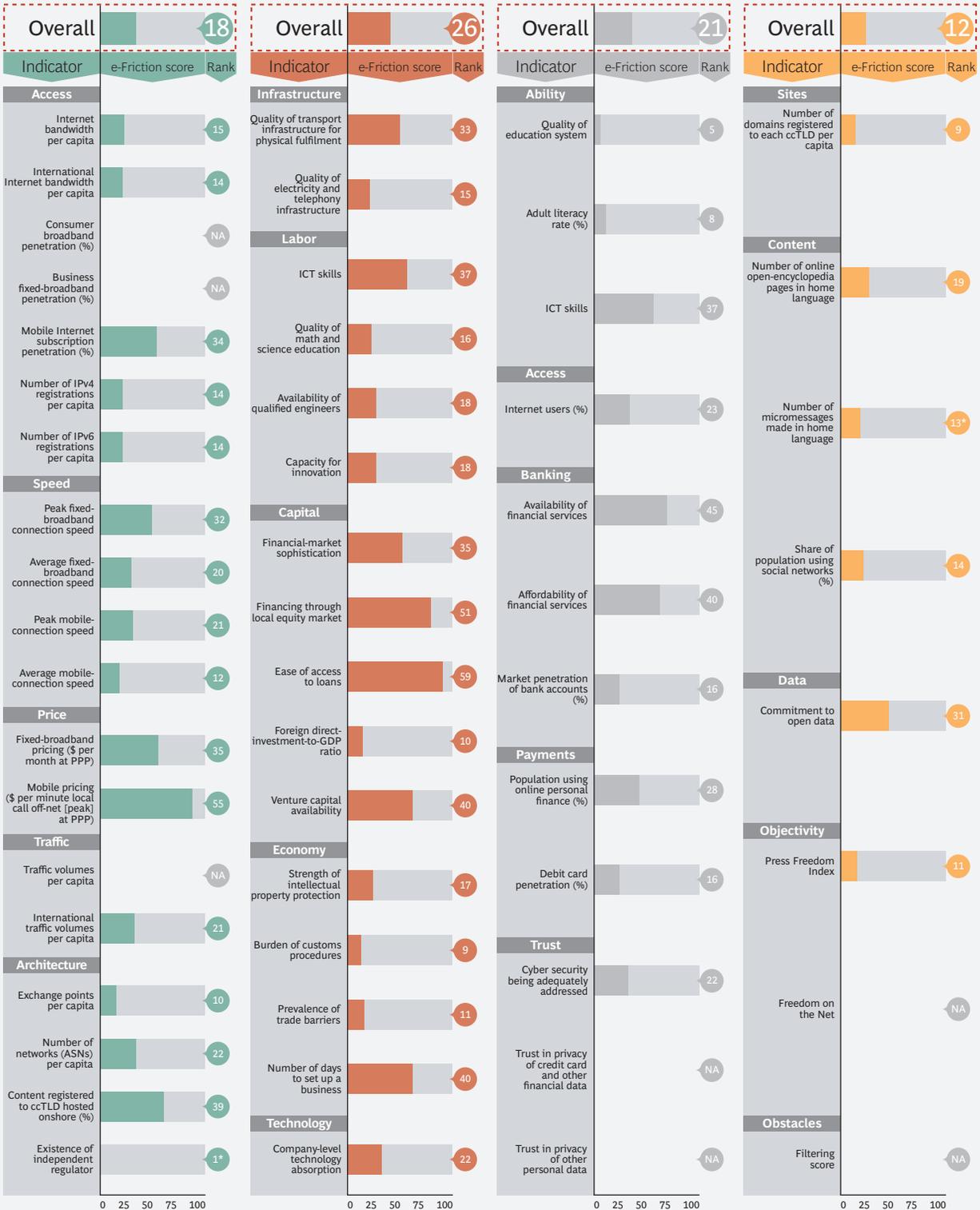


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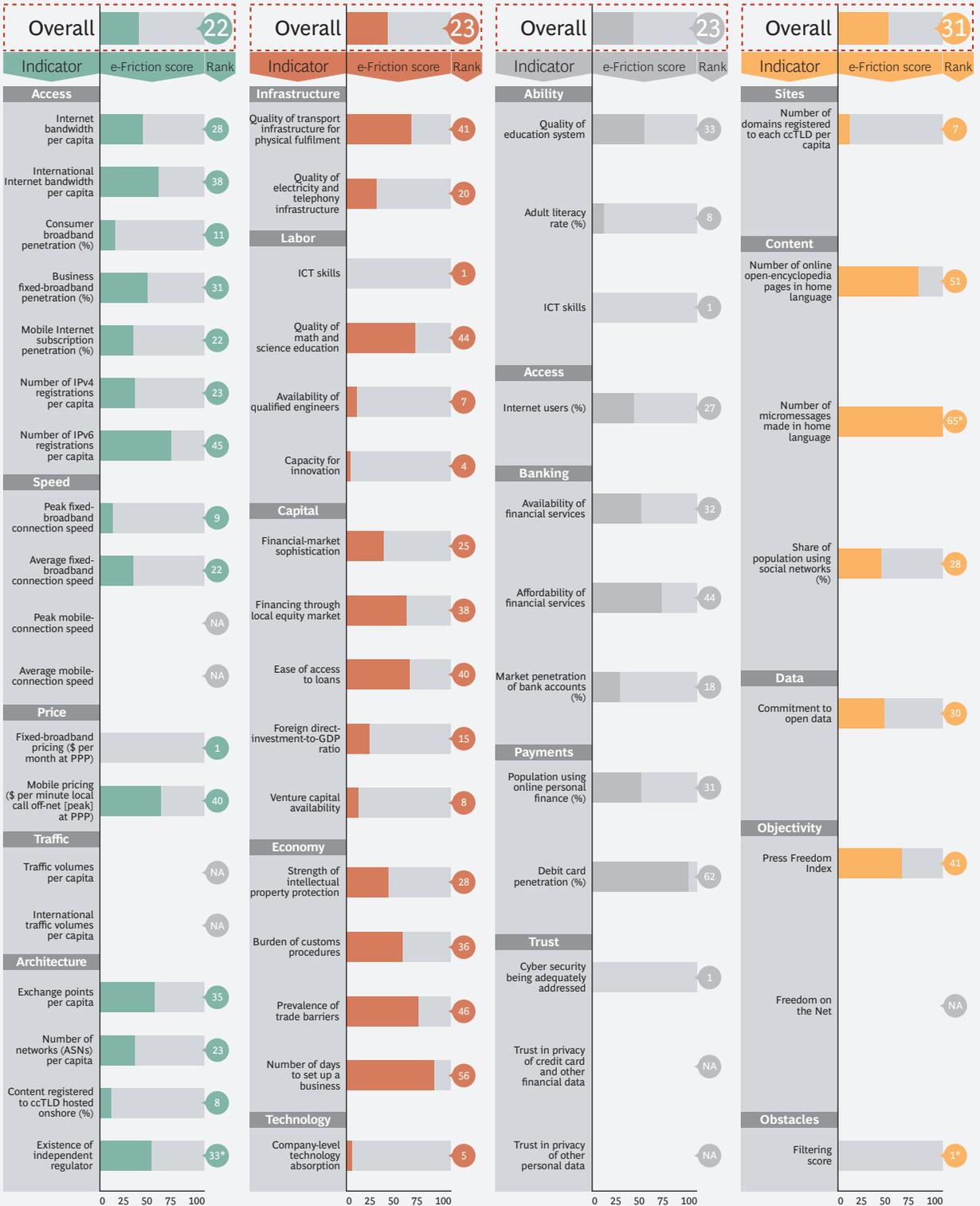


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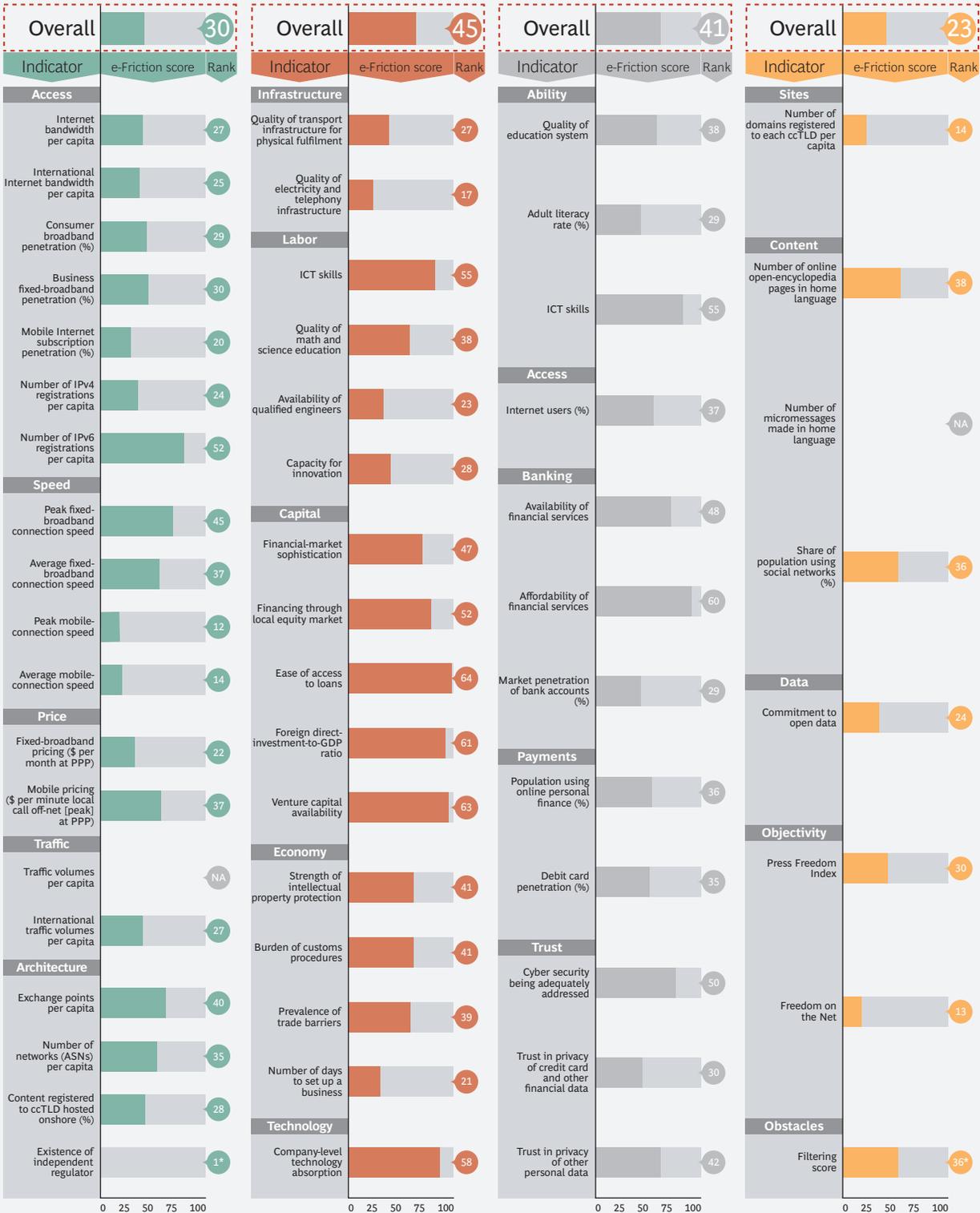
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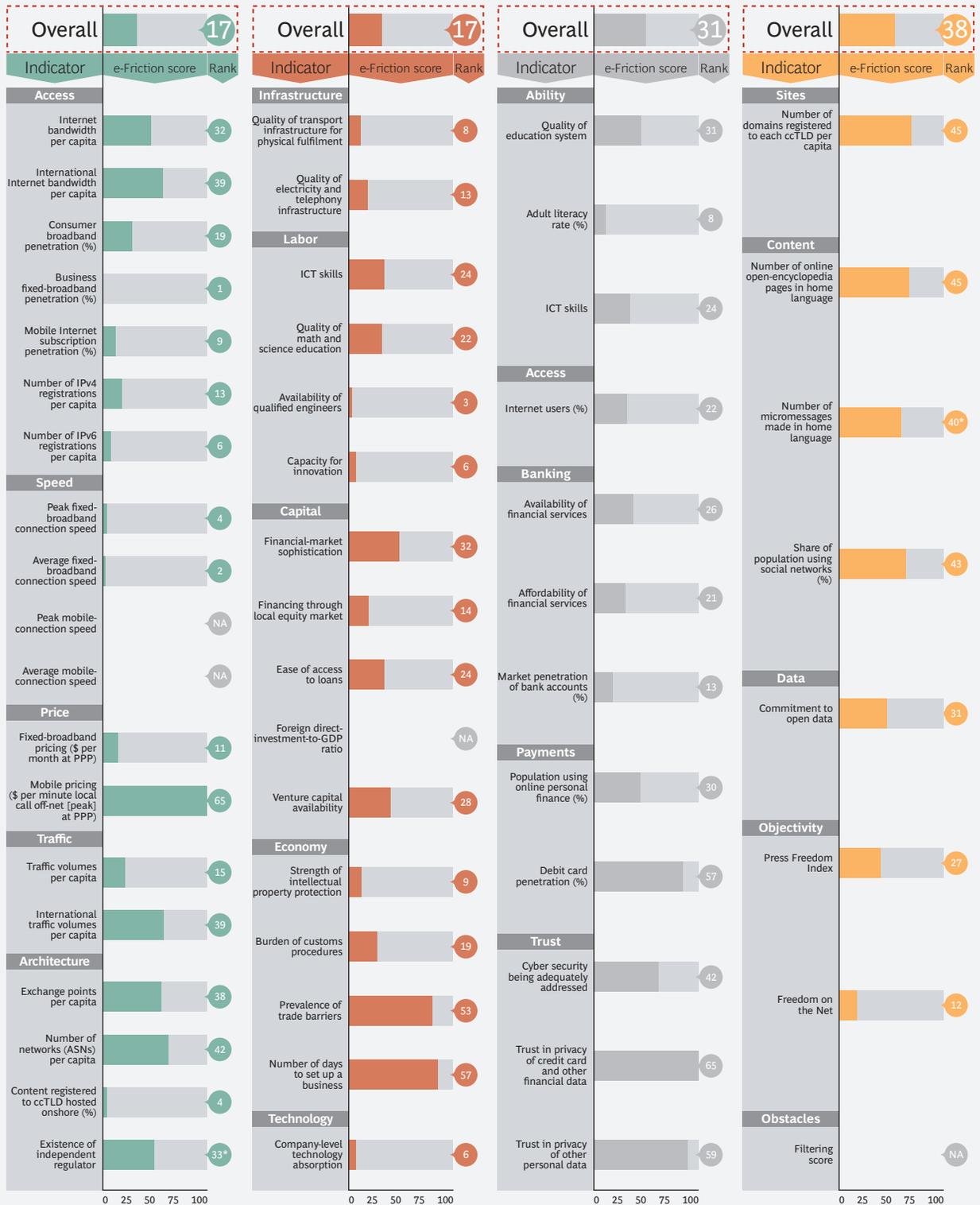


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Source: BCG e-Friction Index model.

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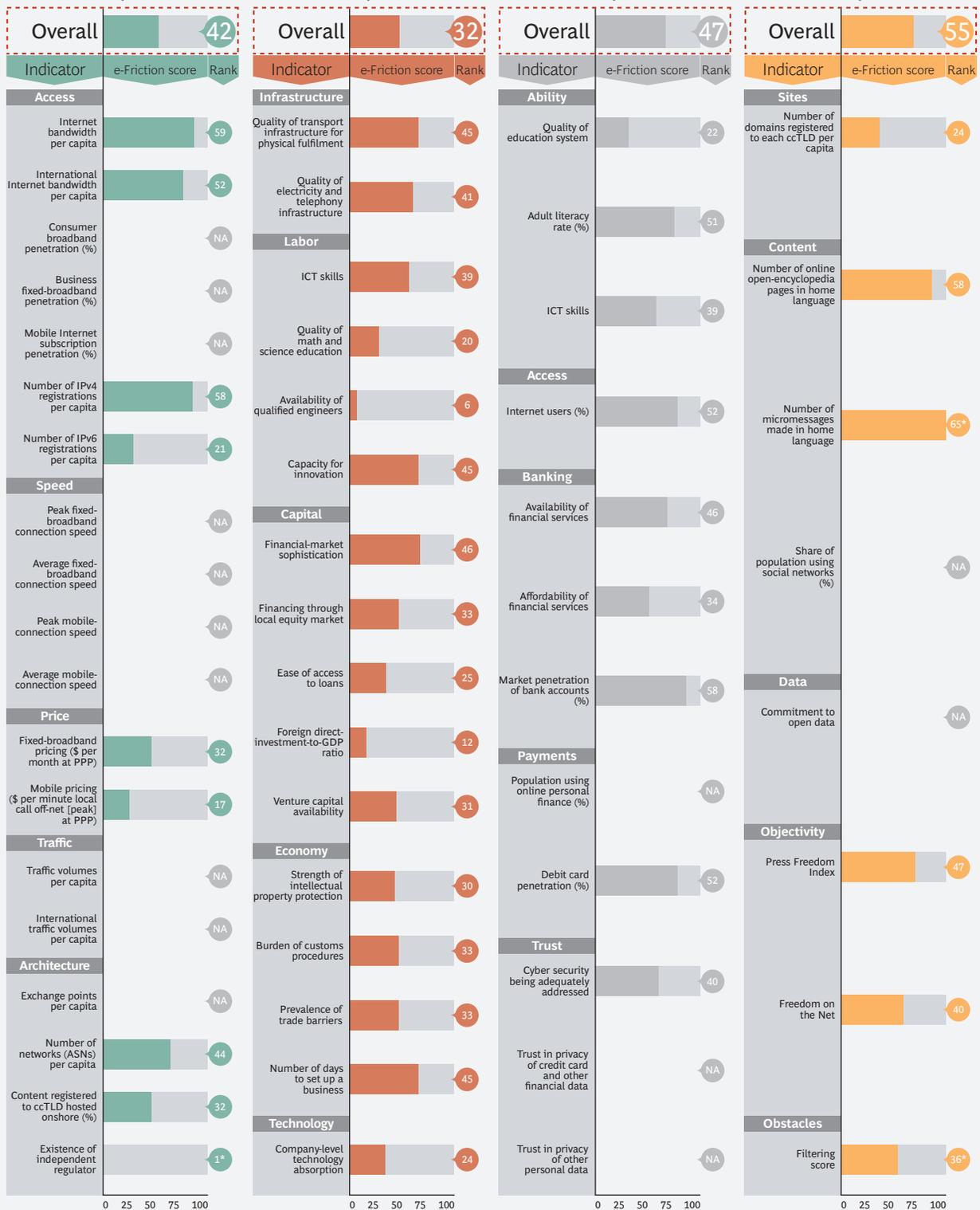


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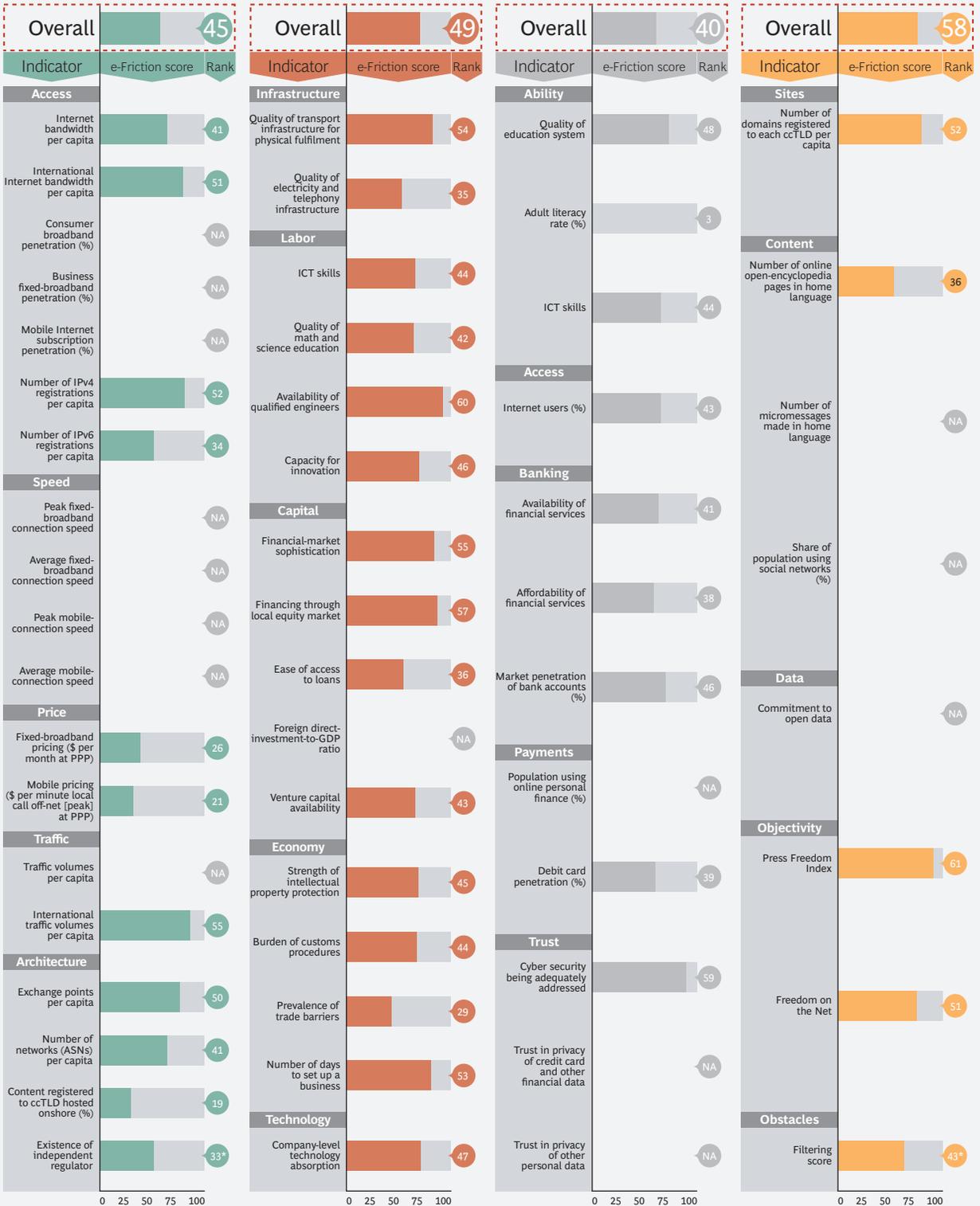


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Note: IPv4 = Internet Protocol version 4; IPv6 = Internet Protocol version 6; PPP = purchasing power parity; ASN = autonomous system number; ccTLD = country code top-level domain; ICT = information and communications technology; * = discrete scale, with several countries sharing an equal ranking; NA = not available. For definitions and source information for each indicator, please see Exhibit 3.

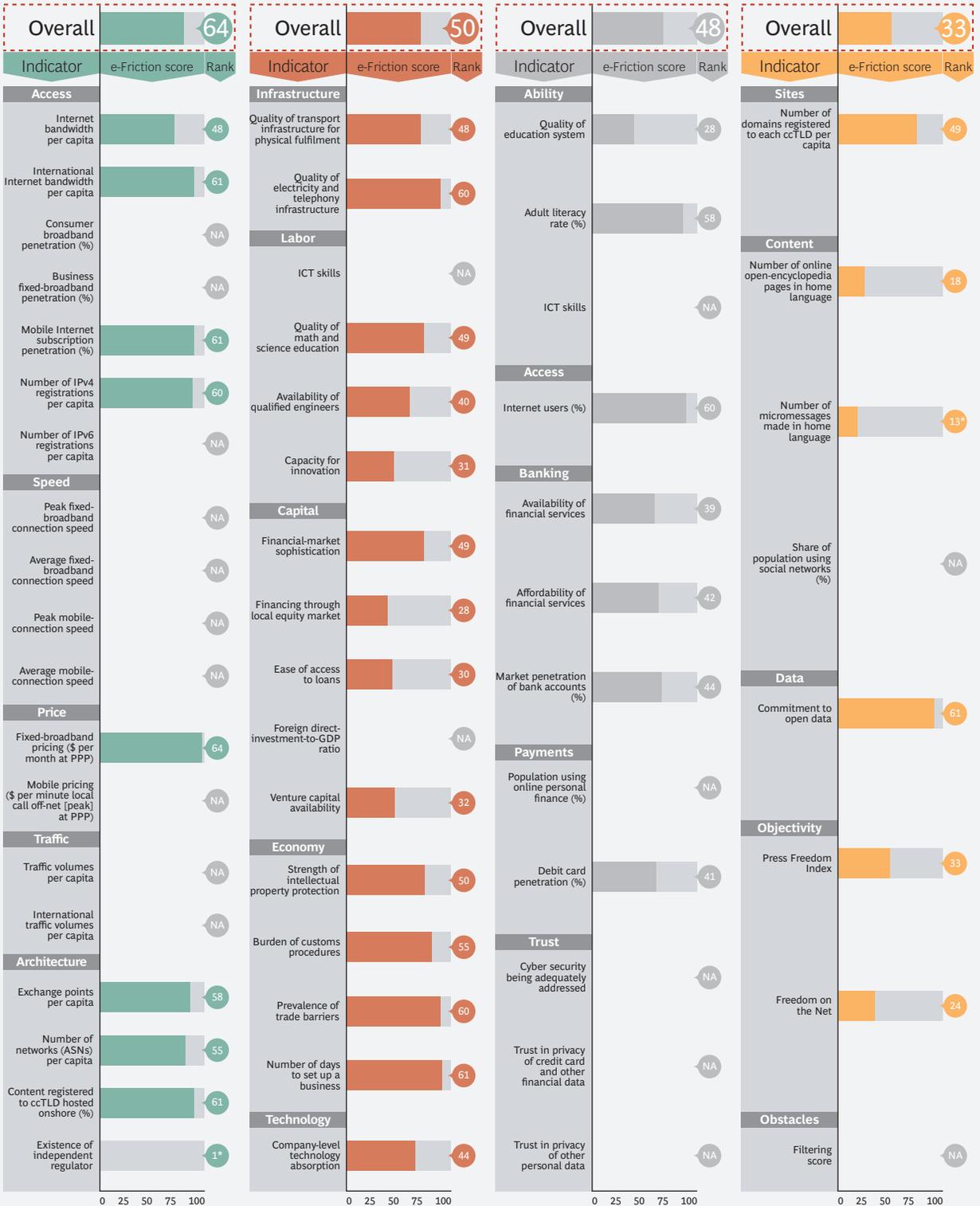


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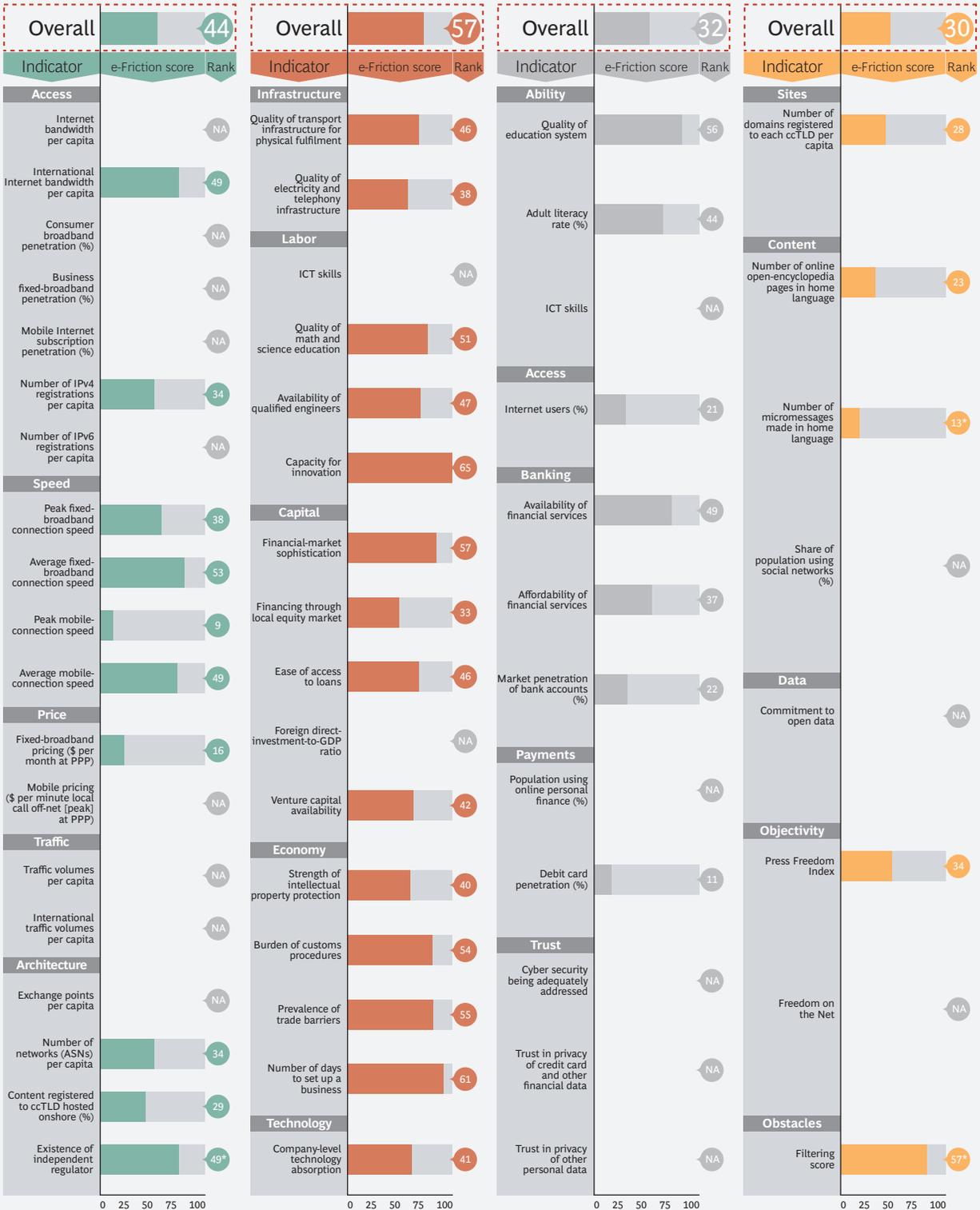


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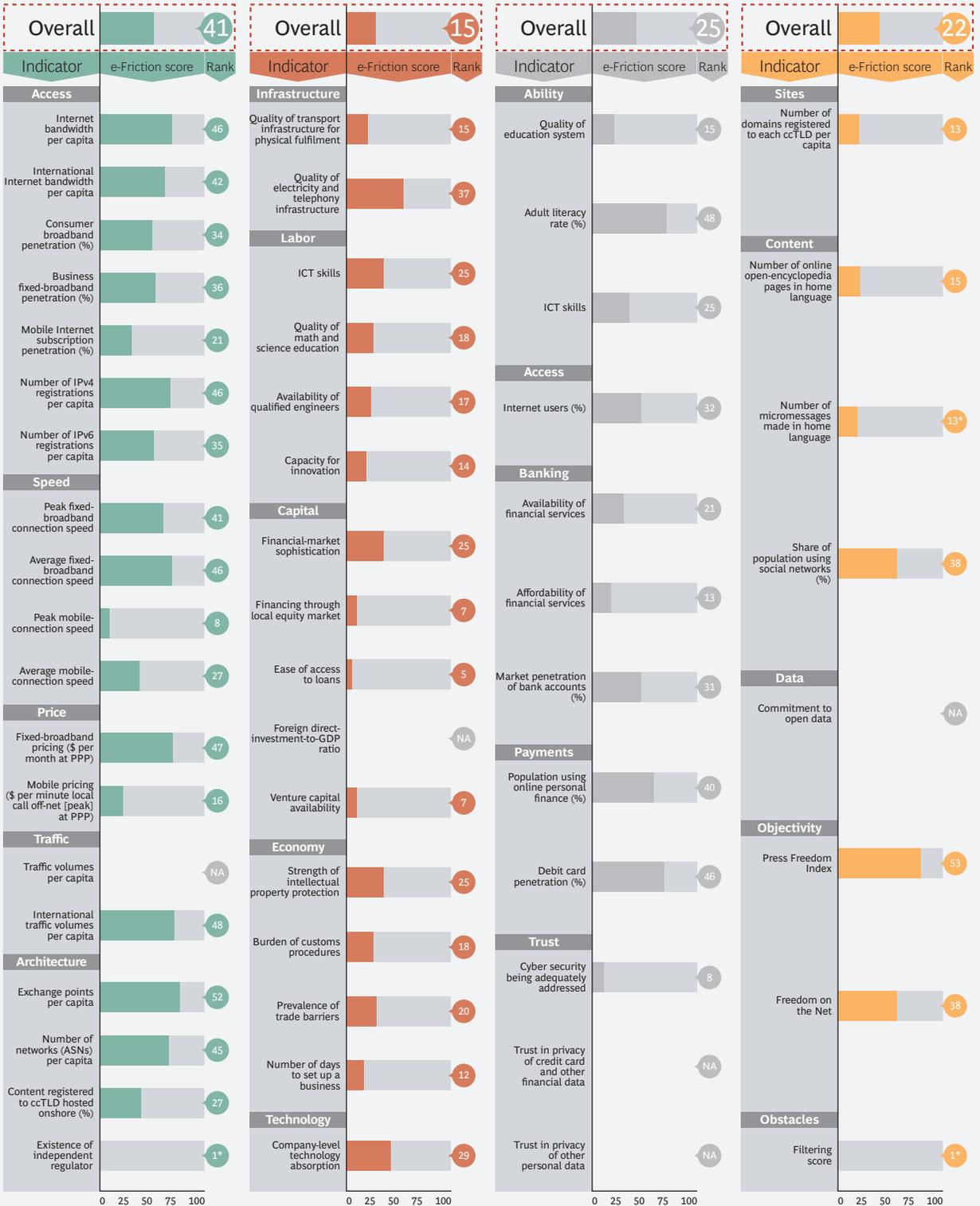


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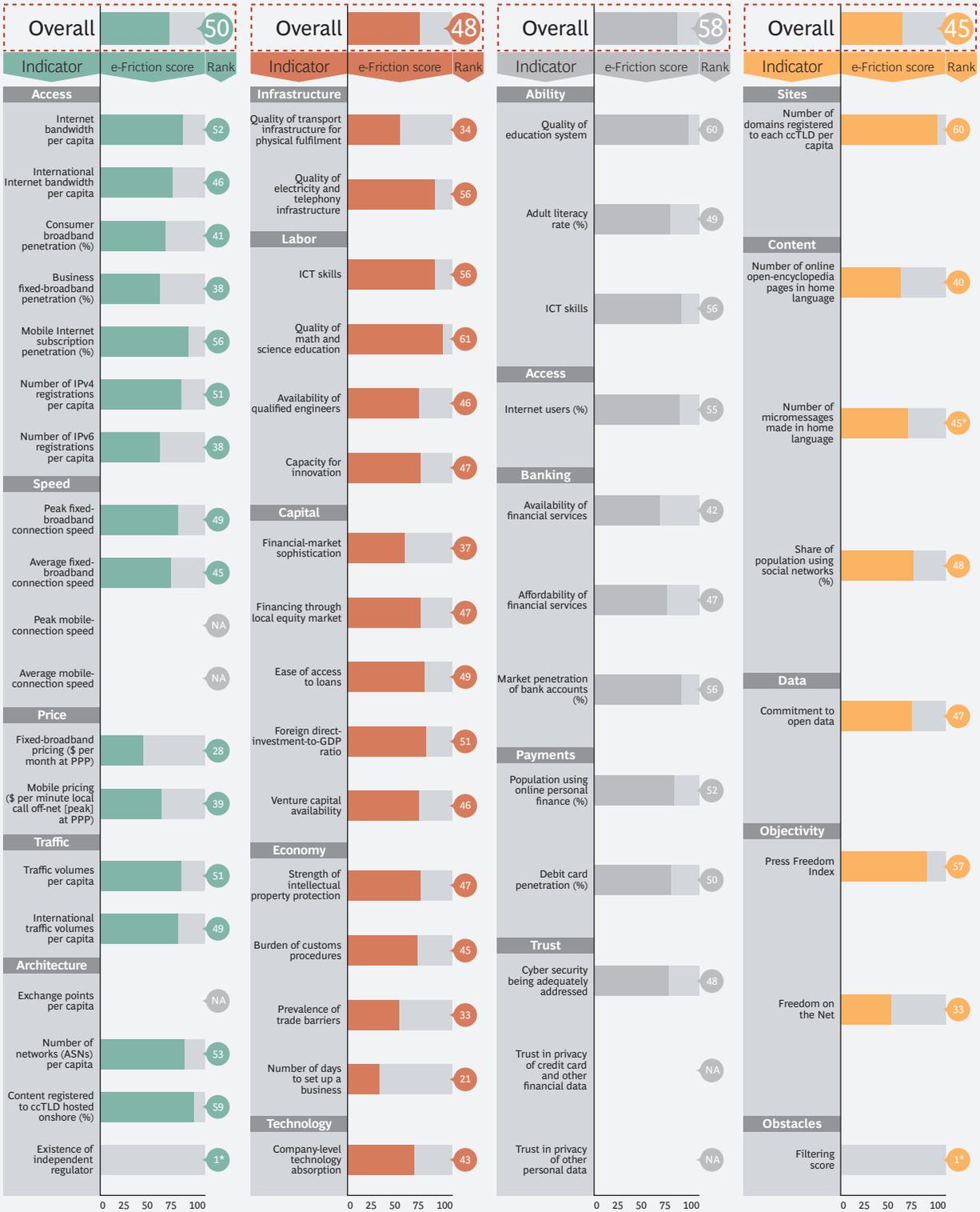


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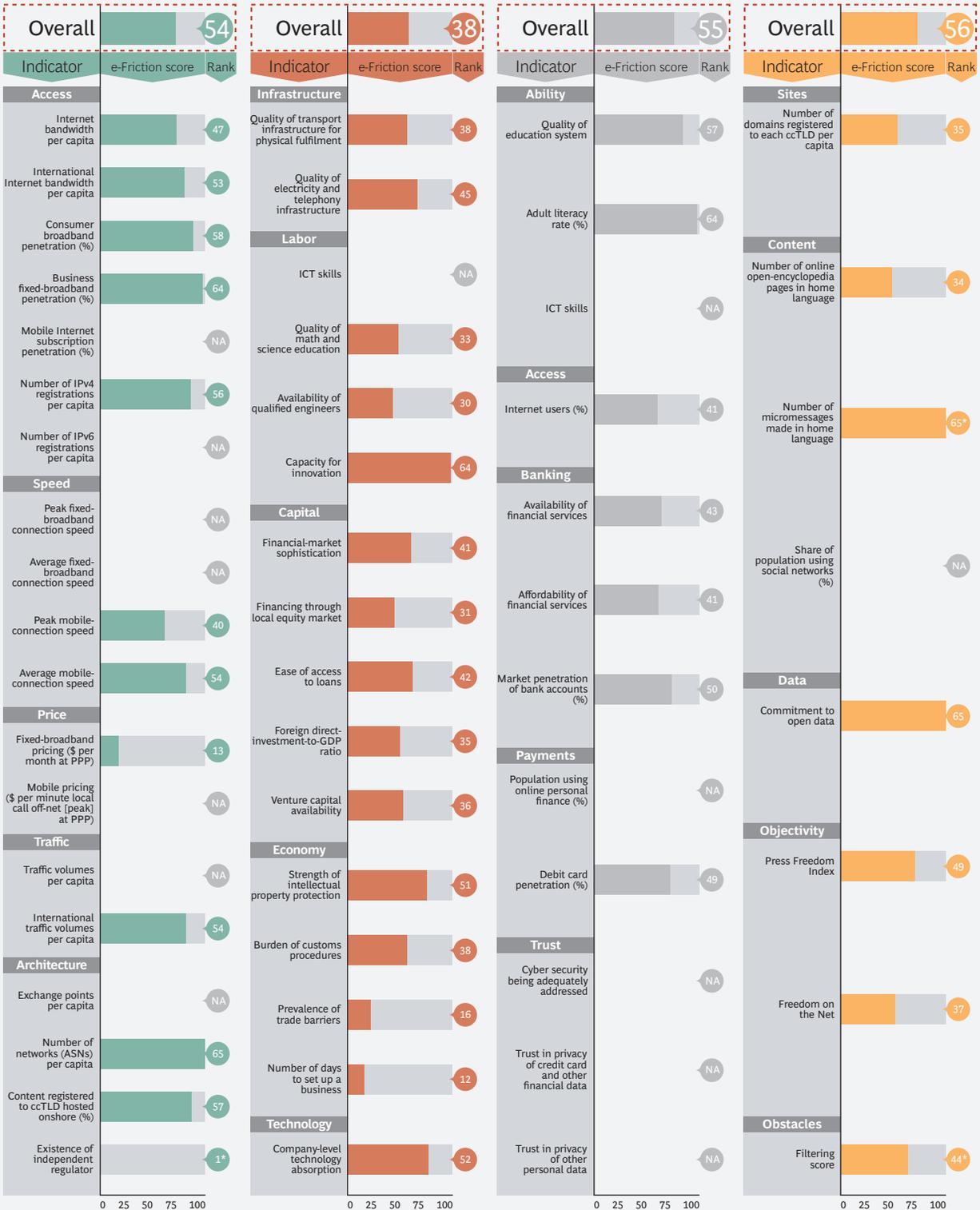


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Note: IPv4 = Internet Protocol version 4; IPv6 = Internet Protocol version 6; PPP = purchasing power parity; ASN = autonomous system number; ccTLD = country code top-level domain; ICT = information and communications technology; * = discrete scale, with several countries sharing an equal ranking; NA = not available. For definitions and source information for each indicator, please see Exhibit 3.

Netherlands

e-Friction Score: 25
Rank: 9

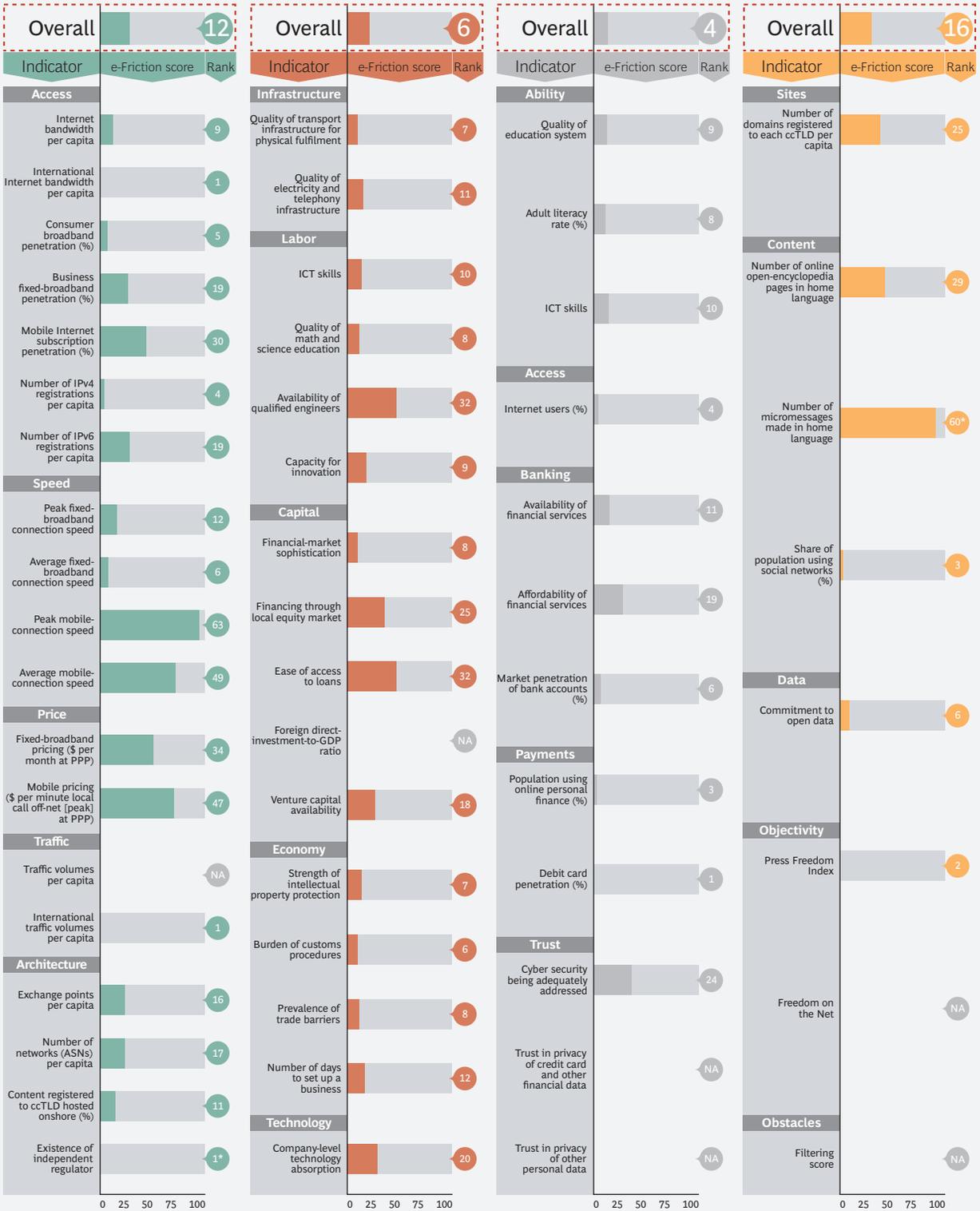


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Source: BCG e-Friction Index model.

Note: IPv4 = Internet Protocol version 4; IPv6 = Internet Protocol version 6; PPP = purchasing power parity; ASN = autonomous system number; ccTLD = country code top-level domain; ICT = information and communications technology; * = discrete scale, with several countries having an equal ranking; NA = not available. For definitions and source information for each indicator, please see Exhibit 3.

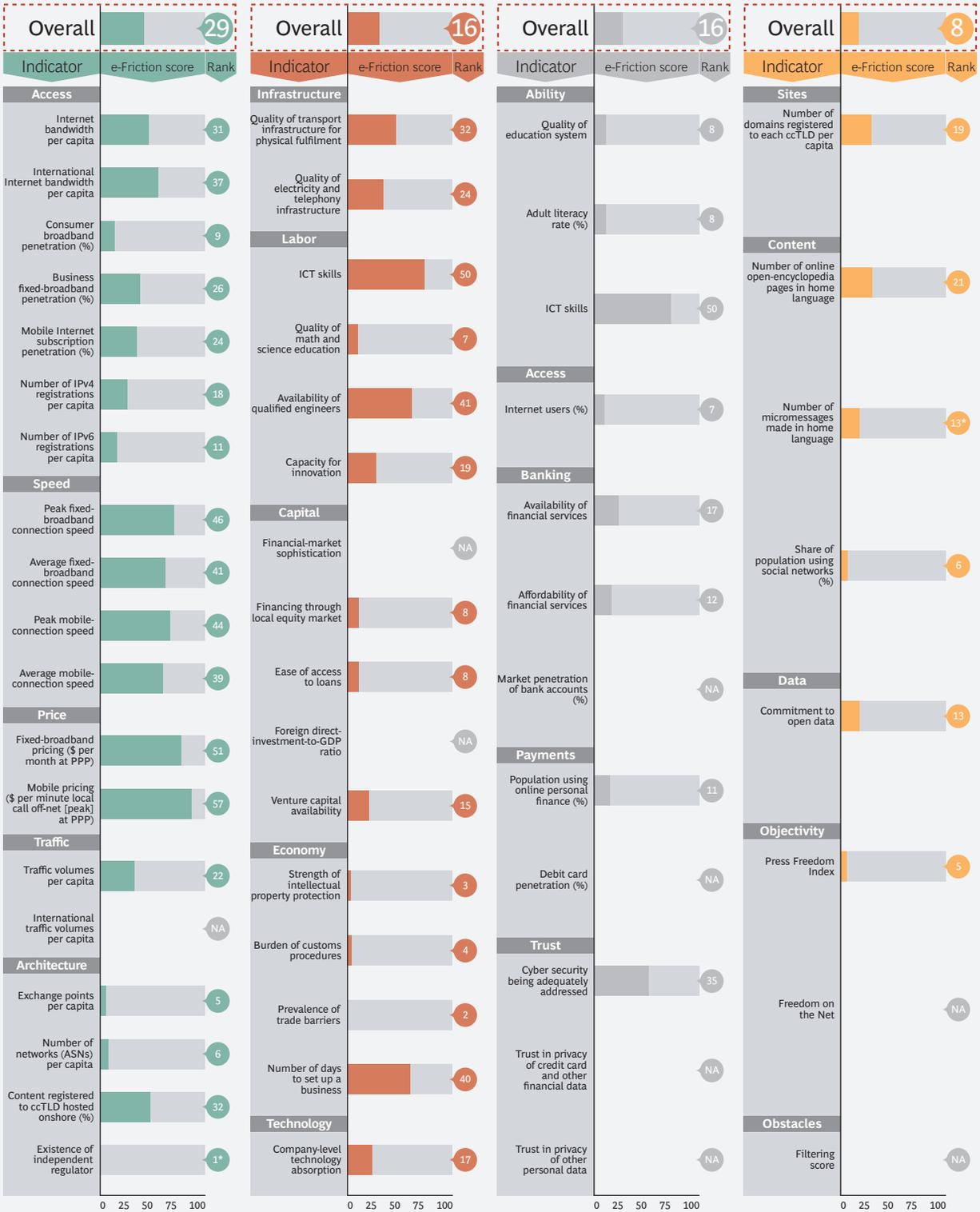


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Source: BCG e-Friction Index model.

Note: IPv4 = Internet Protocol version 4; IPv6 = Internet Protocol version 6; PPP = purchasing power parity; ASN = autonomous system number; ccTLD = country code top-level domain; ICT = information and communications technology; * = discrete scale, with several countries sharing an equal ranking; NA = not available. For definitions and source information for each indicator, please see Exhibit 3.

Nigeria

e-Friction Score: 82
Rank: 65

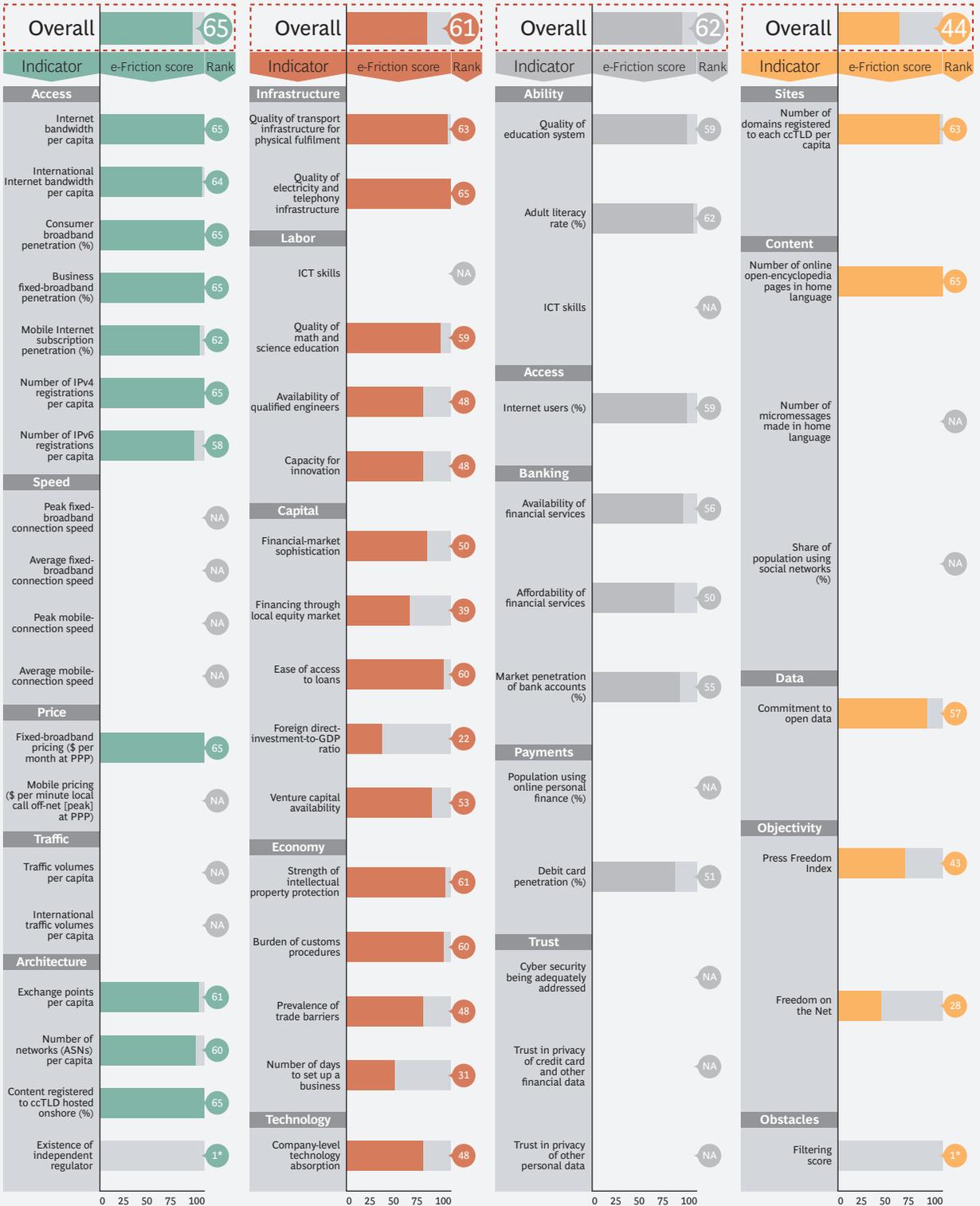


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Note: IPv4 = Internet Protocol version 4; IPv6 = Internet Protocol version 6; PPP = purchasing power parity; ASN = autonomous system number; ccTLD = country code top-level domain; ICT = information and communications technology; * = discrete scale, with several countries having an equal ranking; NA = not available. For definitions and source information for each indicator, please see Exhibit 3.

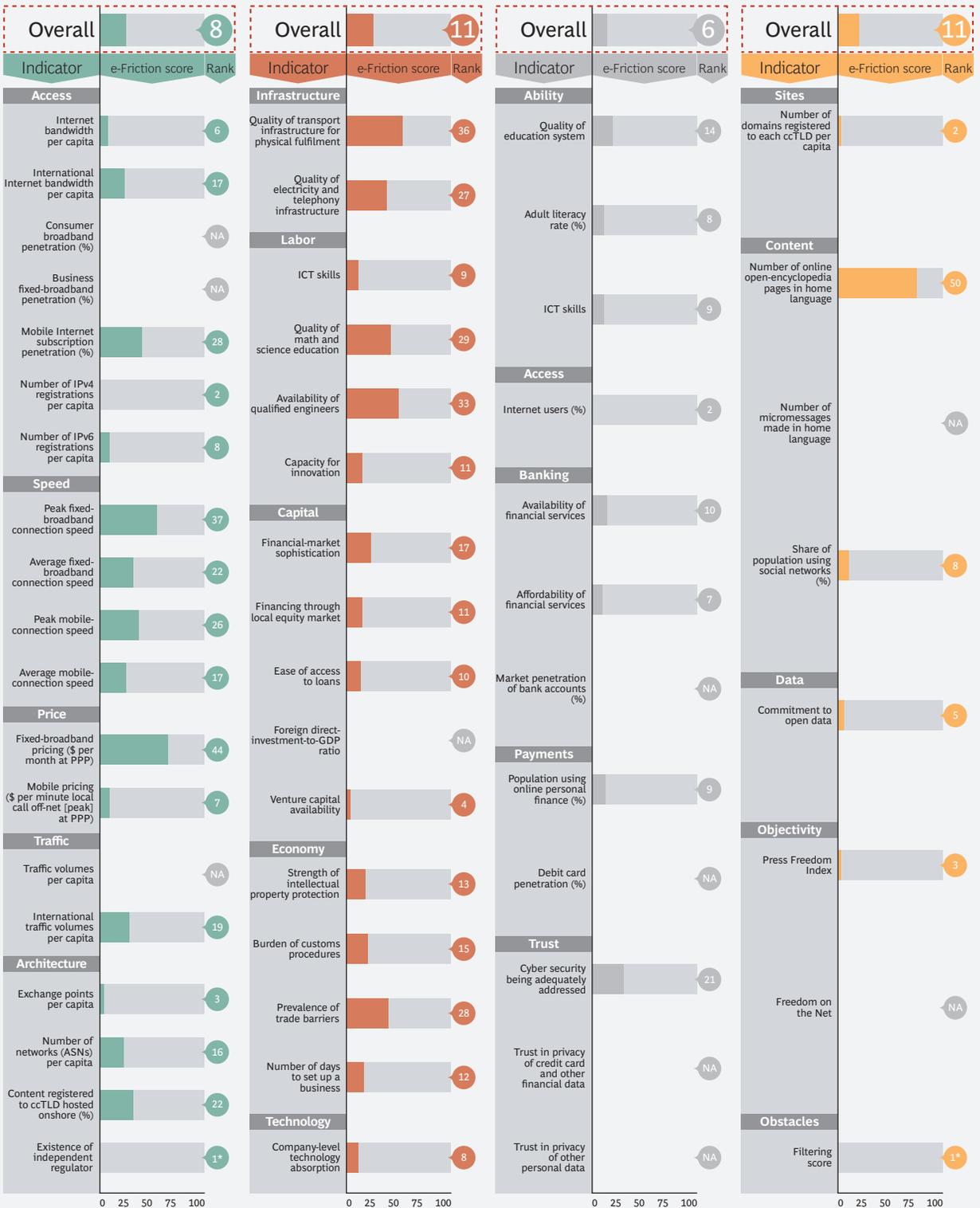


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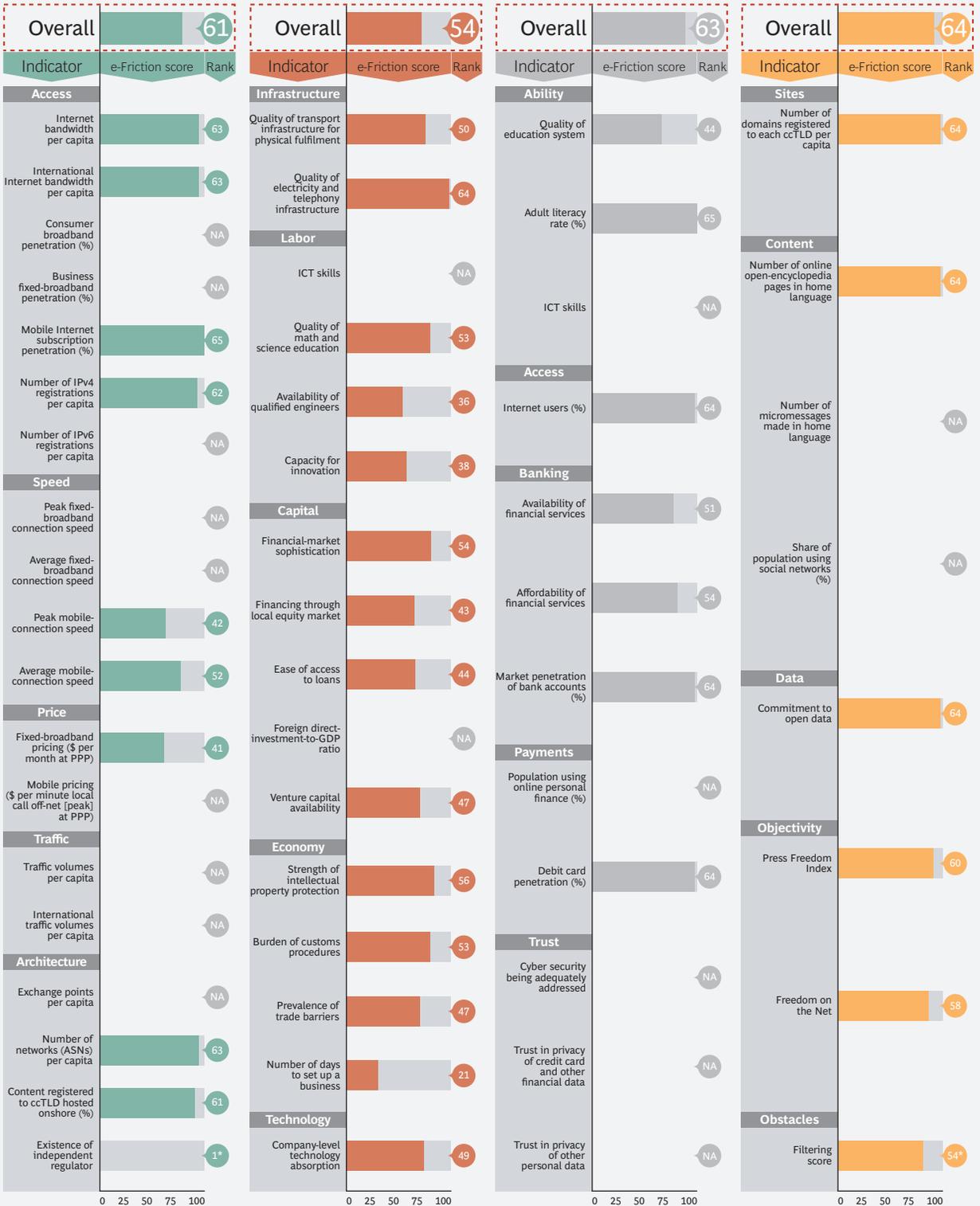


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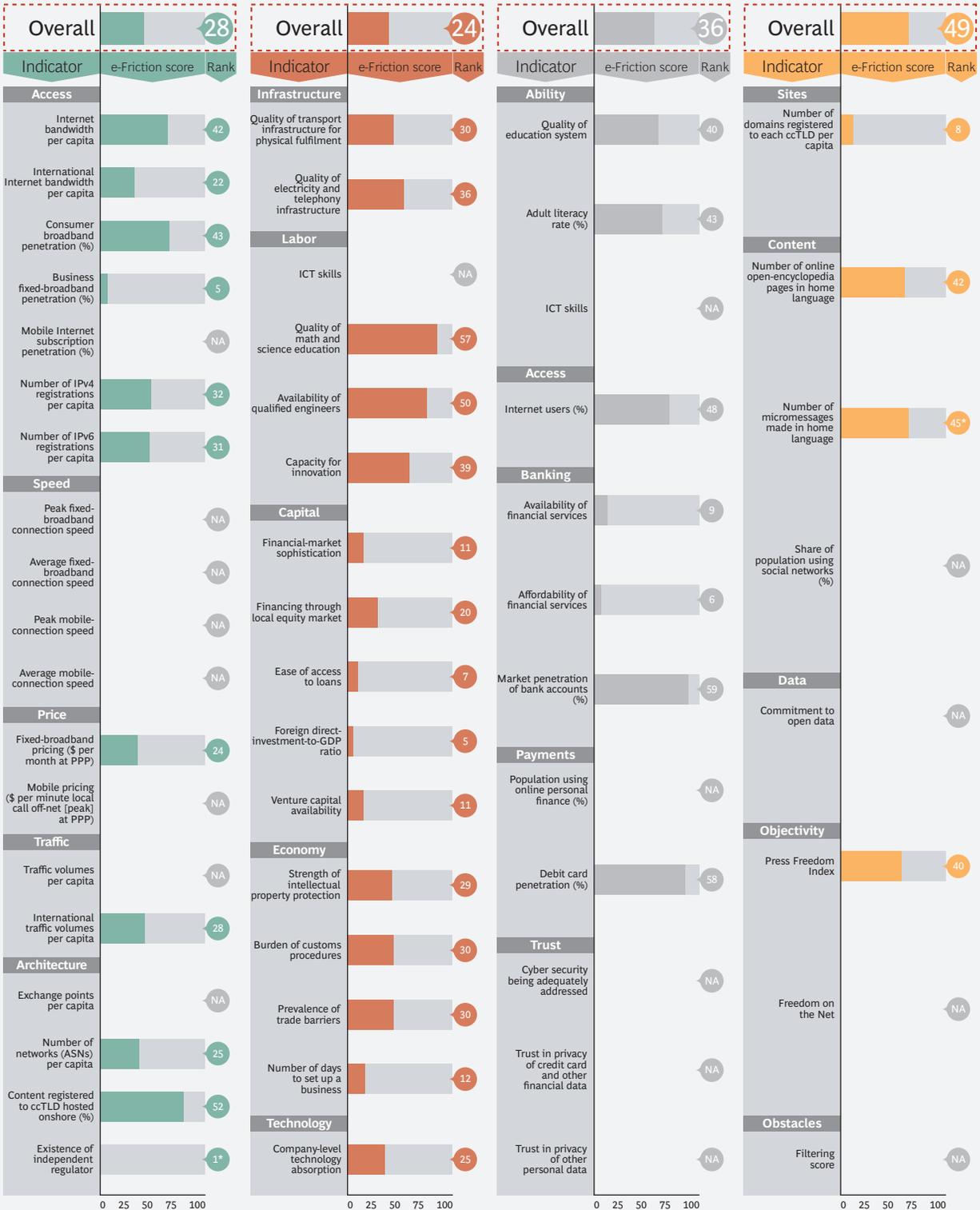


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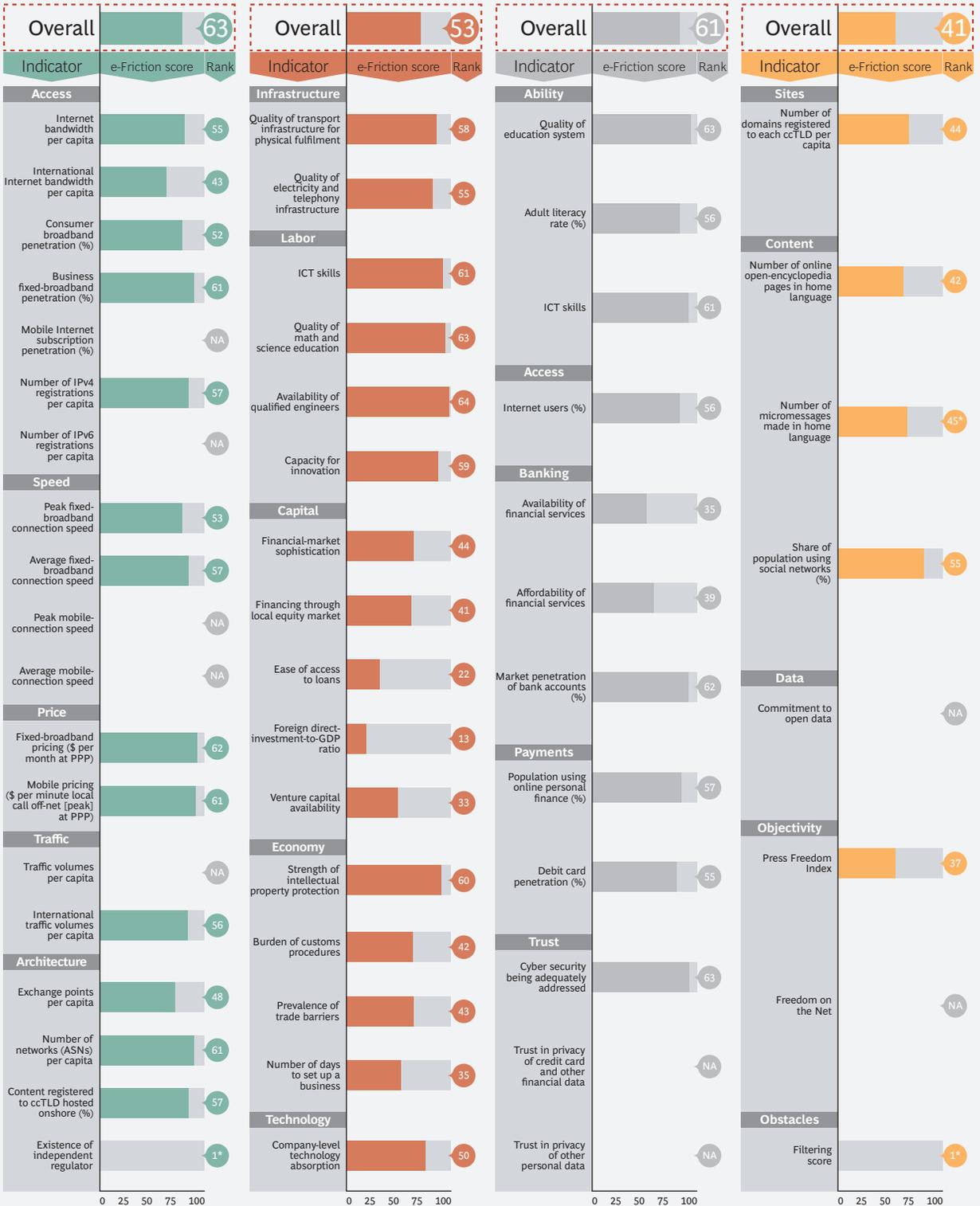


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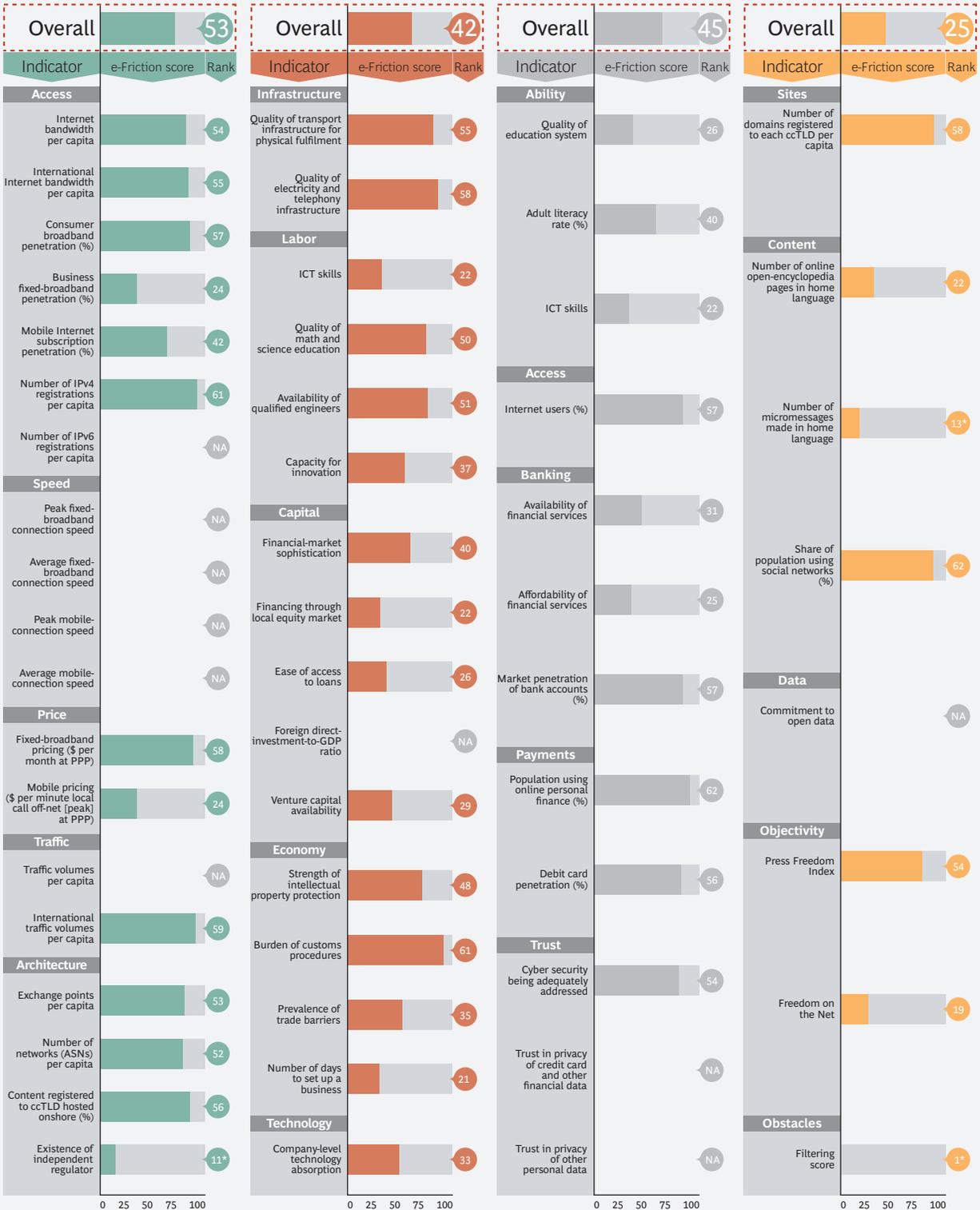


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Source: BCG e-Friction Index model.

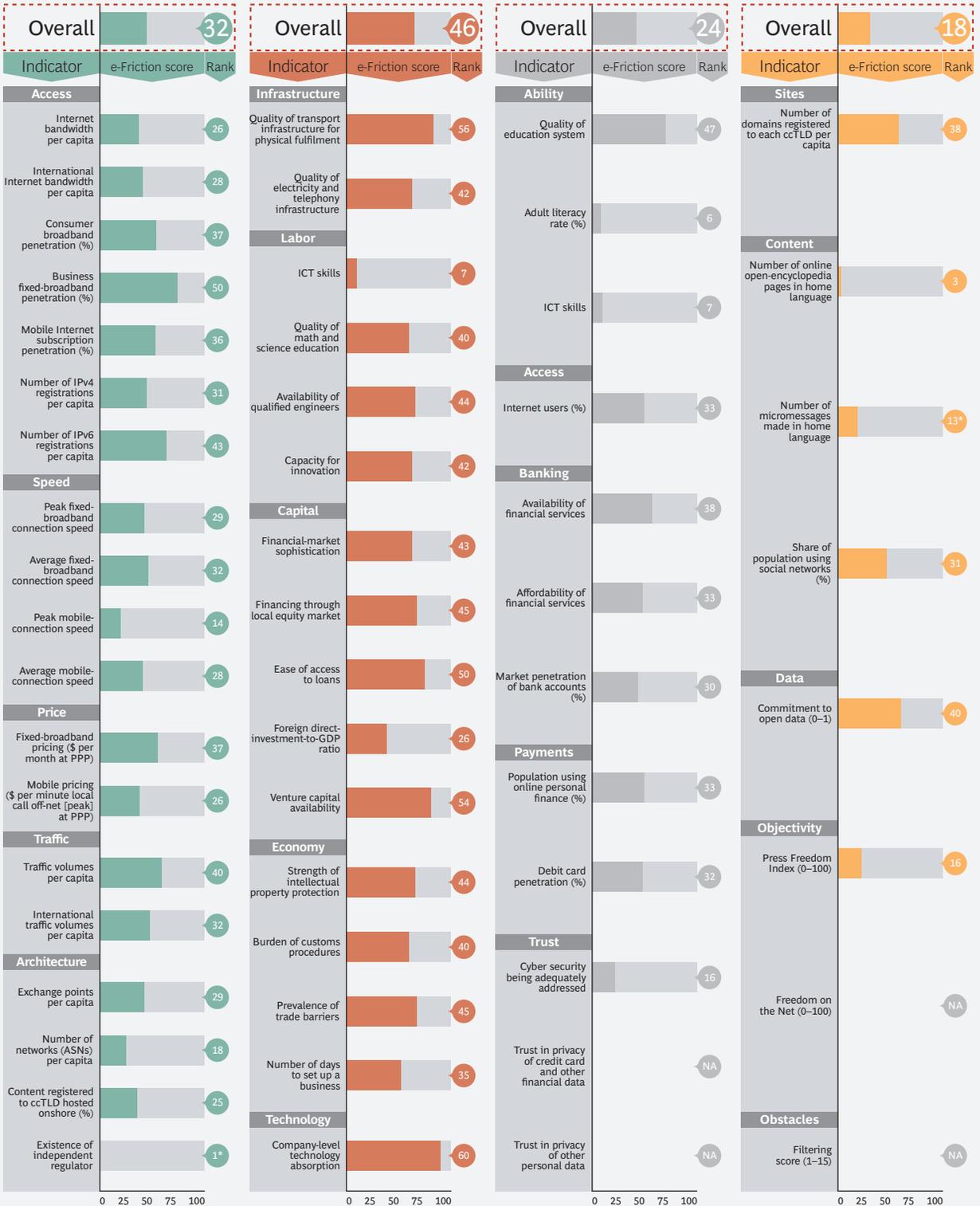
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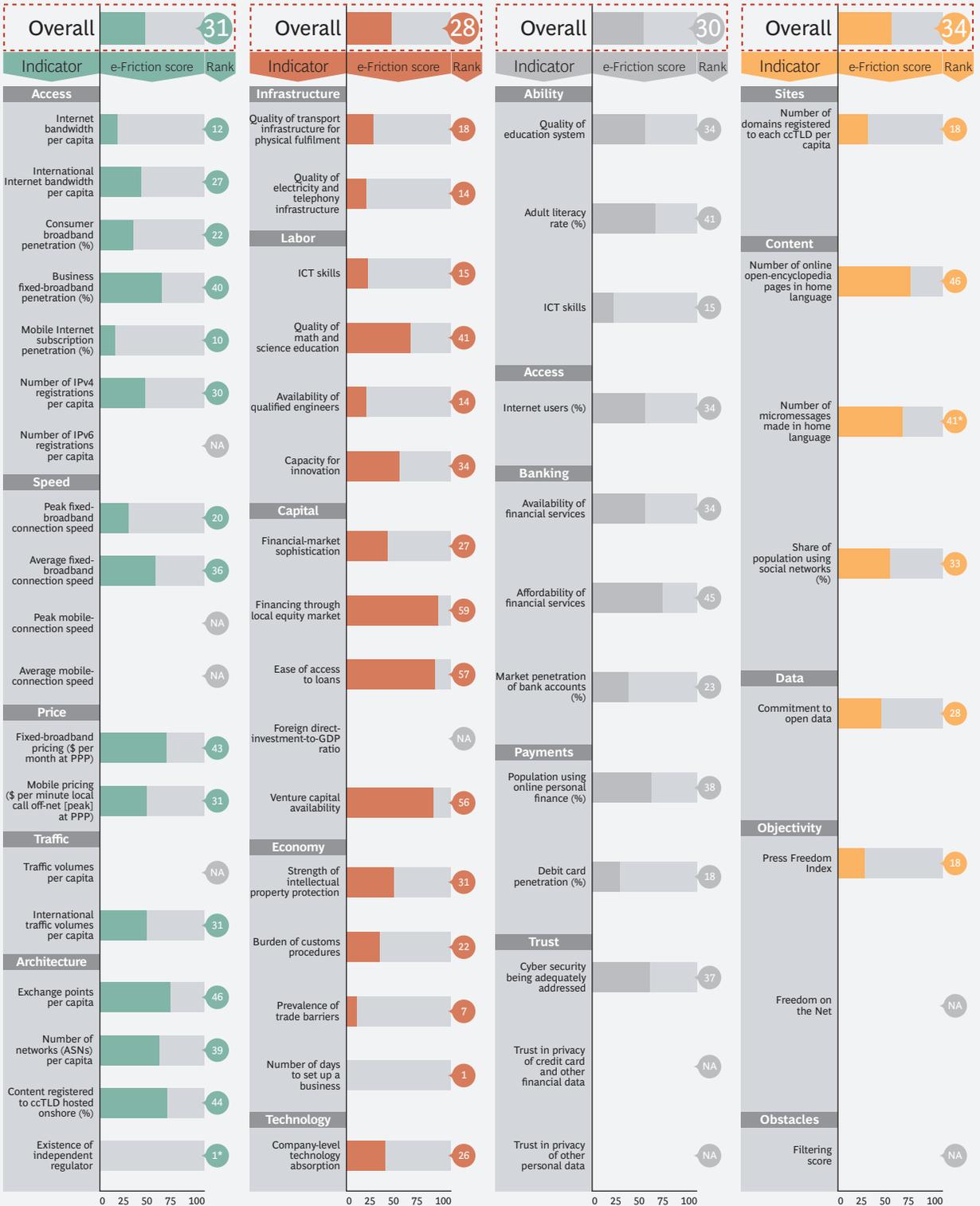


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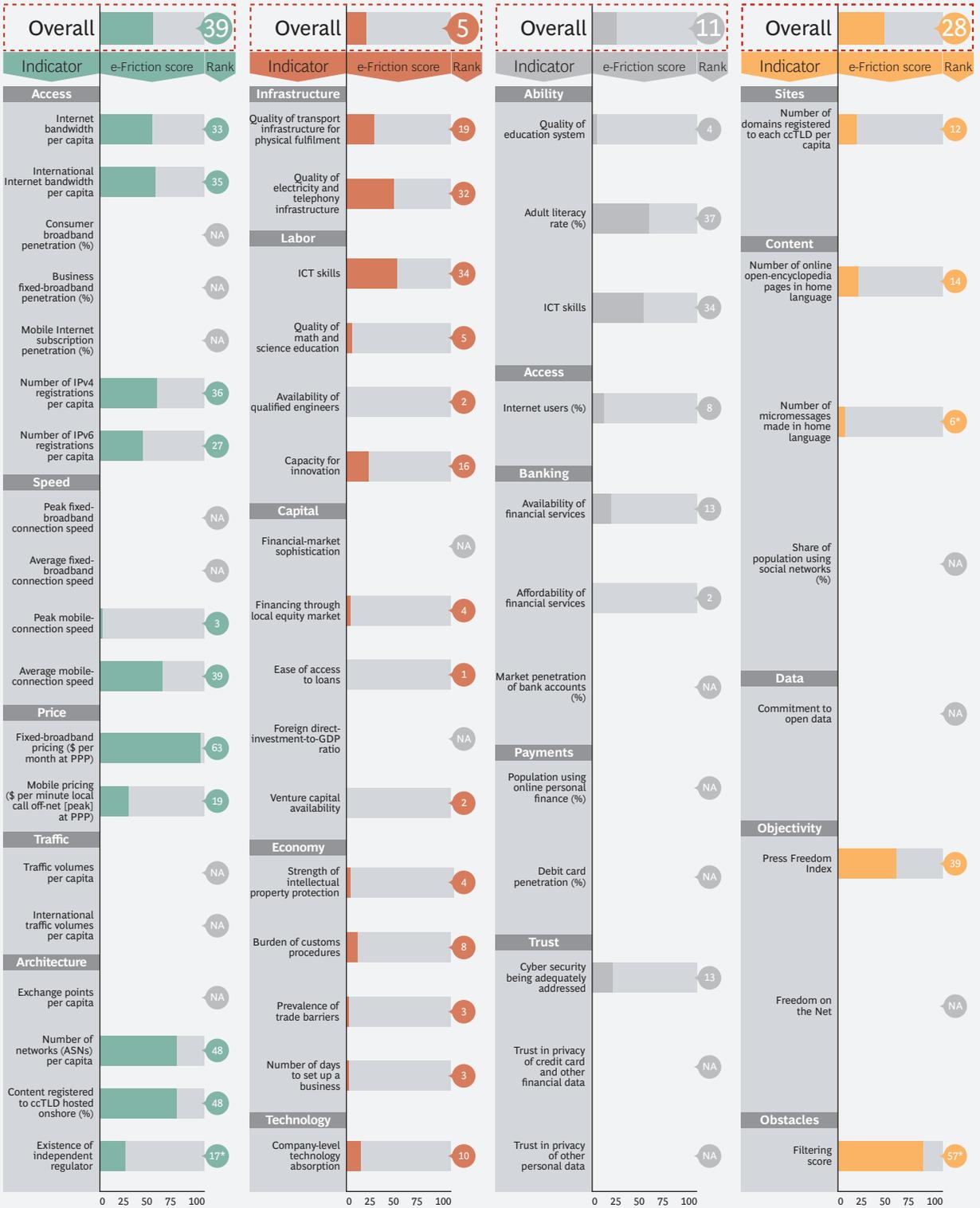


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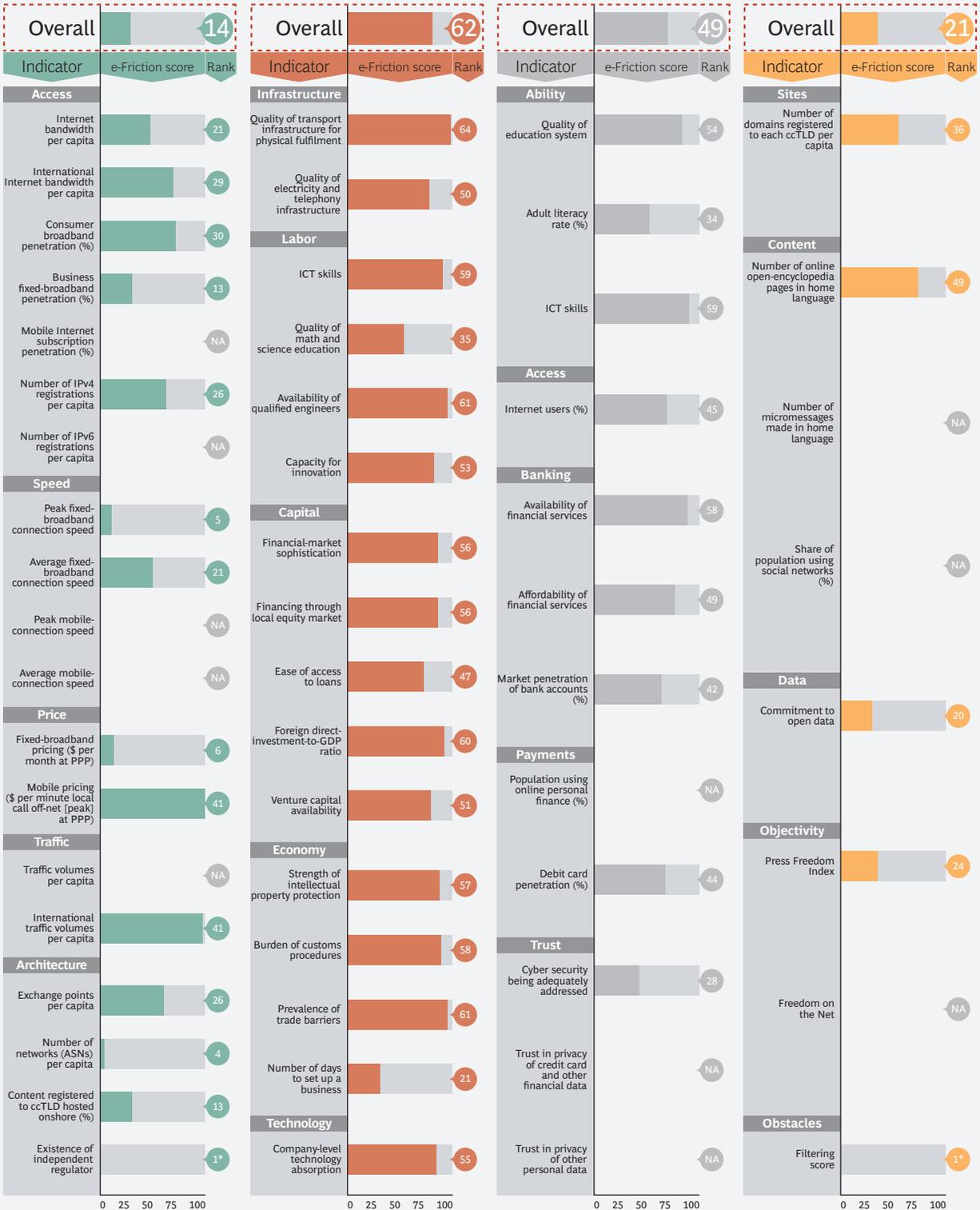


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Russia

e-Friction Score: 57
Rank: 43

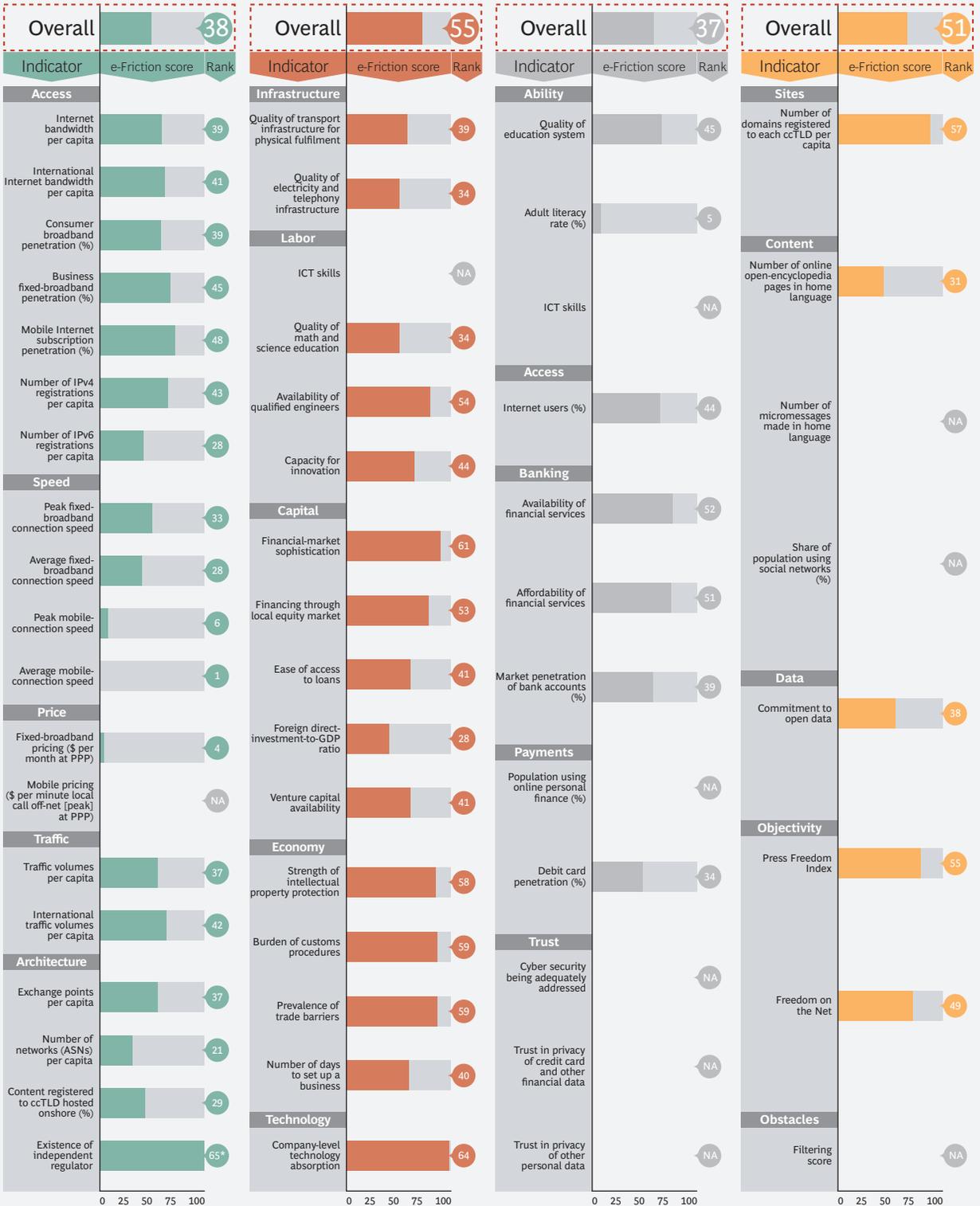


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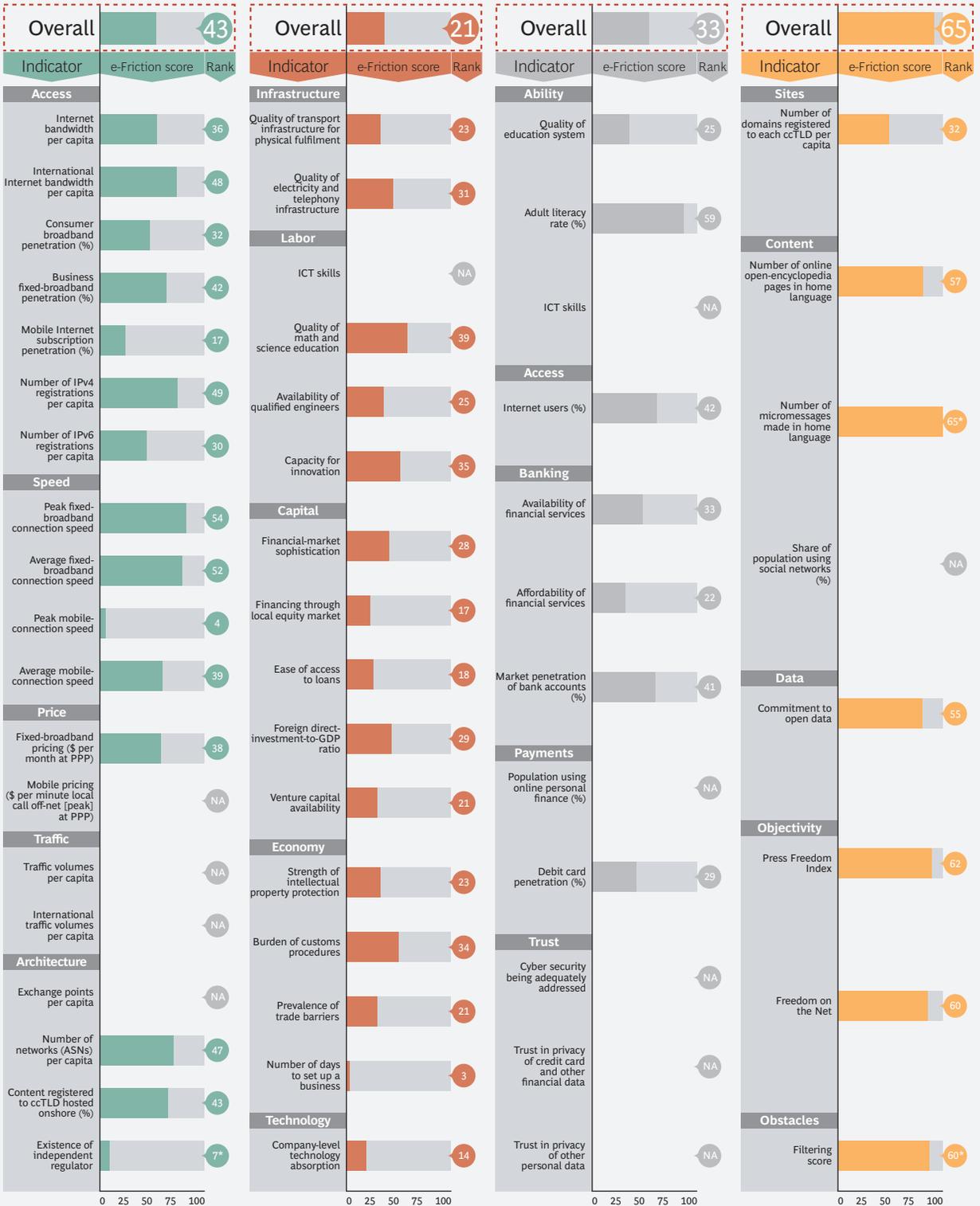


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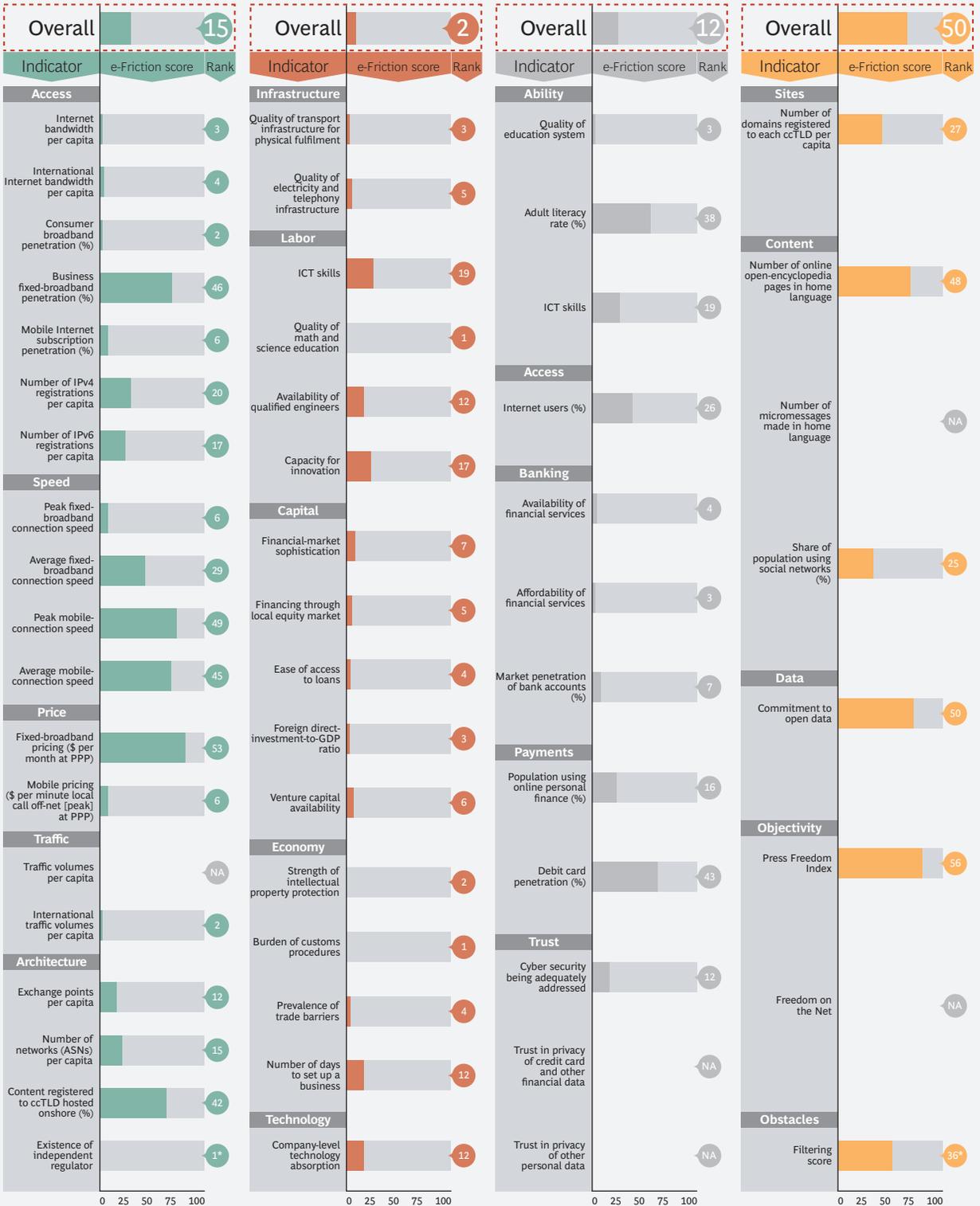


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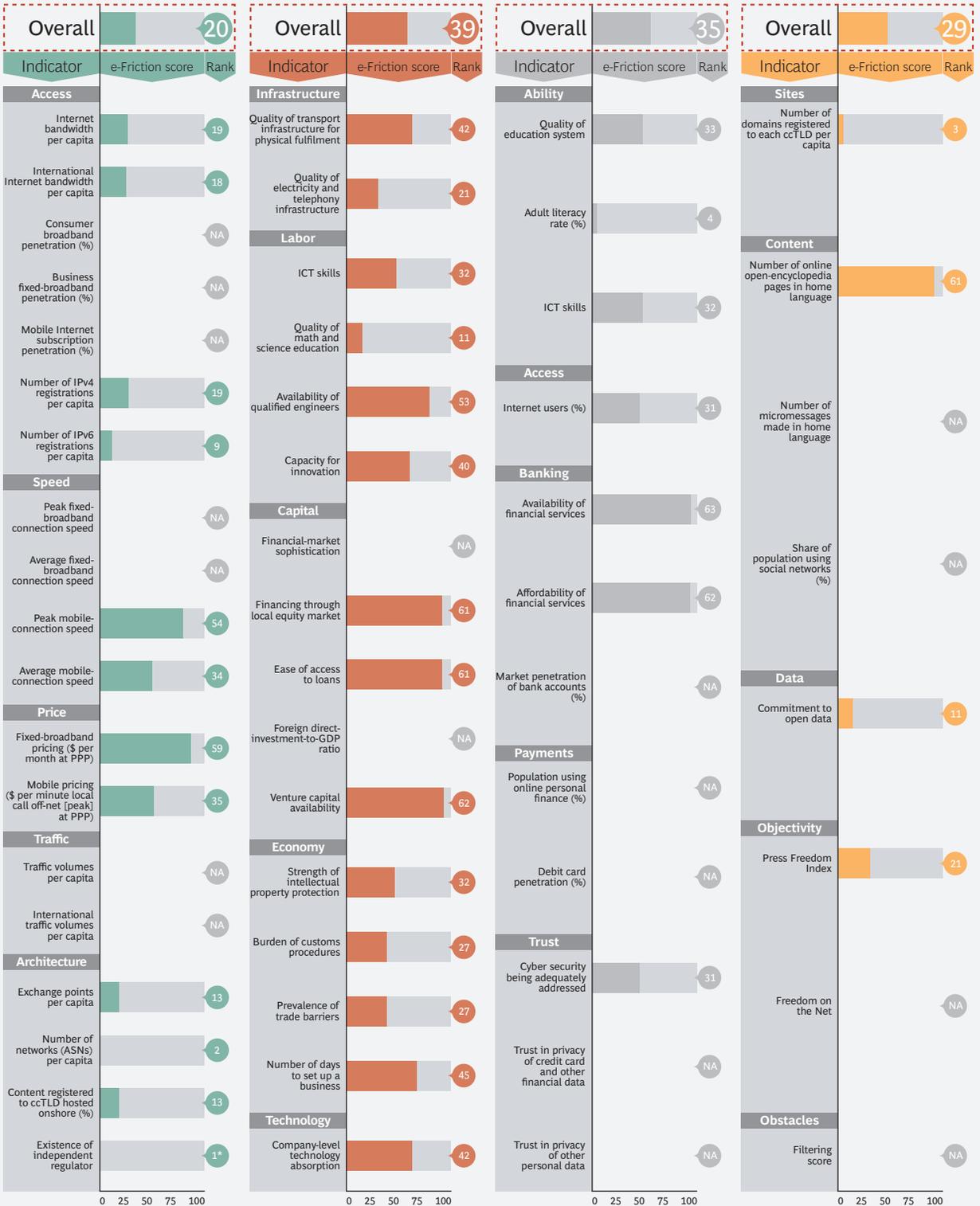


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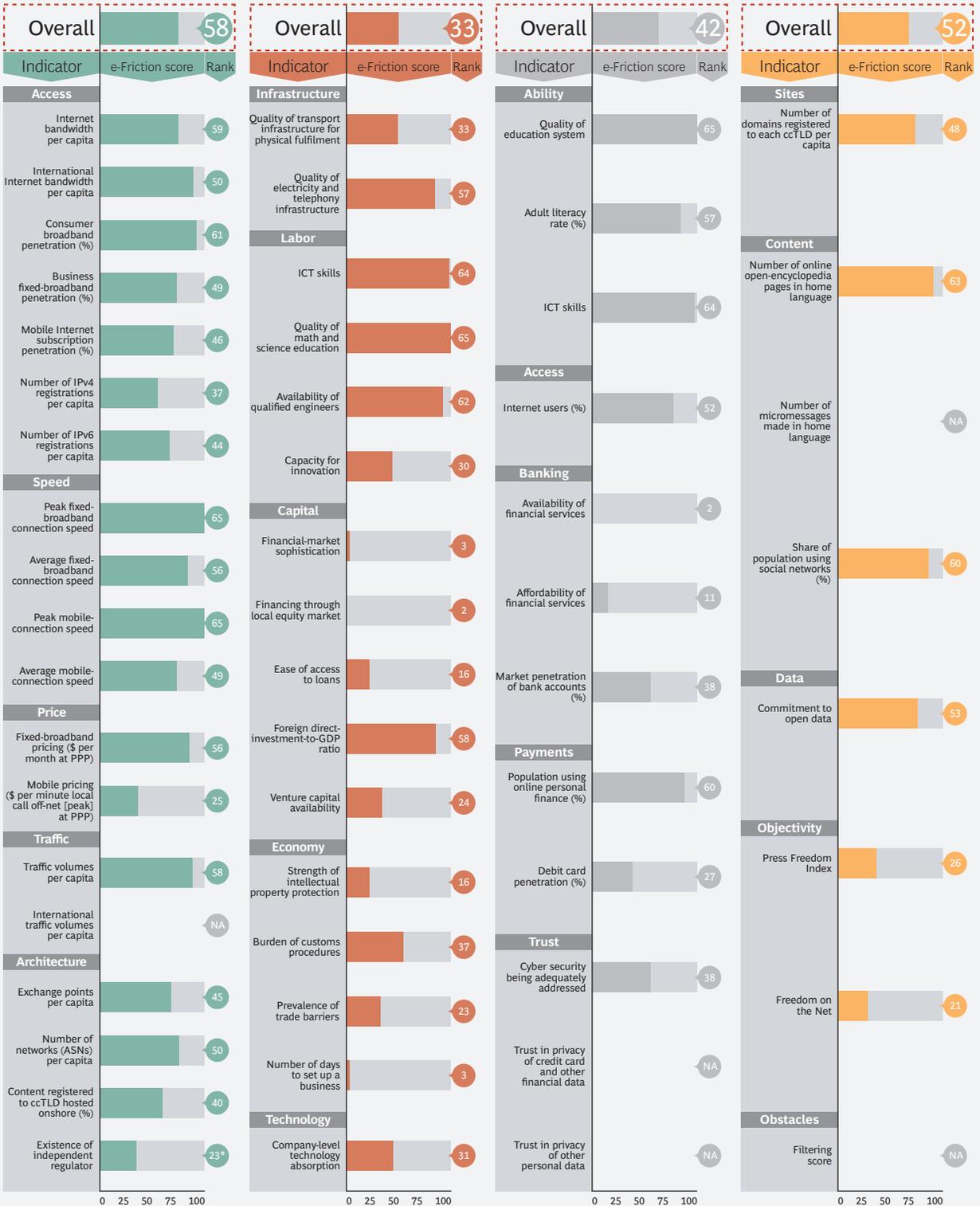


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South Korea

e-Friction Score: 41
Rank: 25

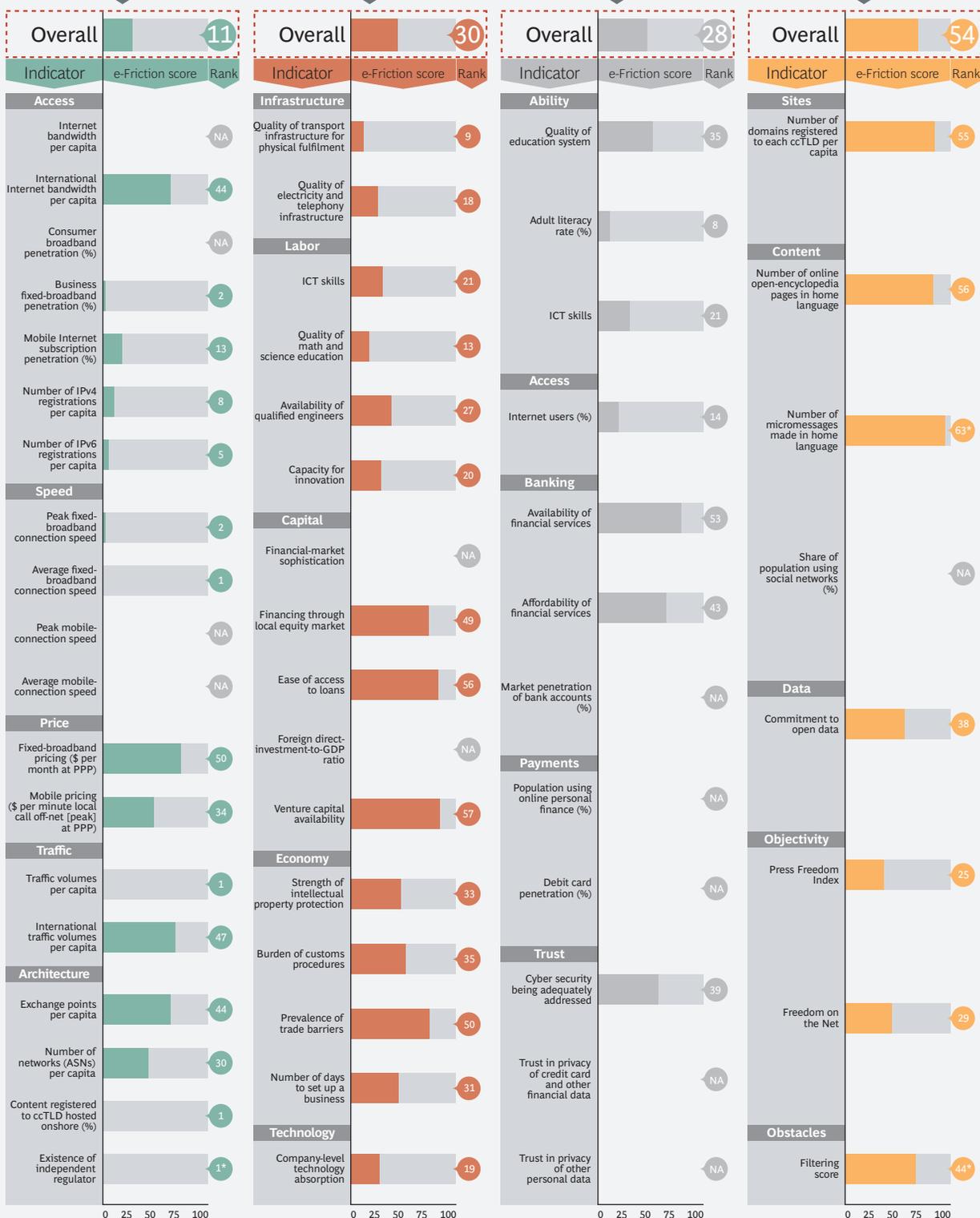


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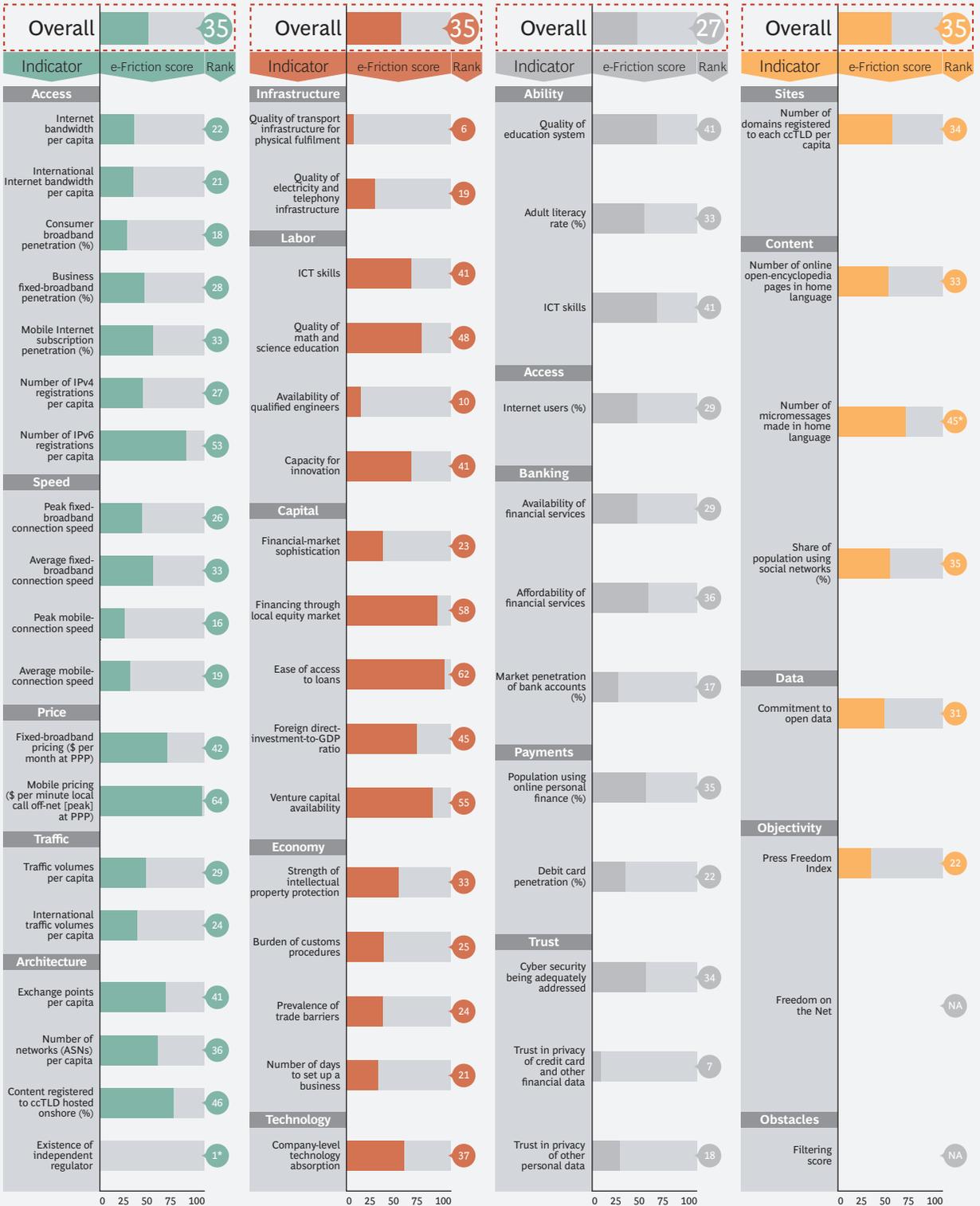


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Source: BCG e-Friction Index model.

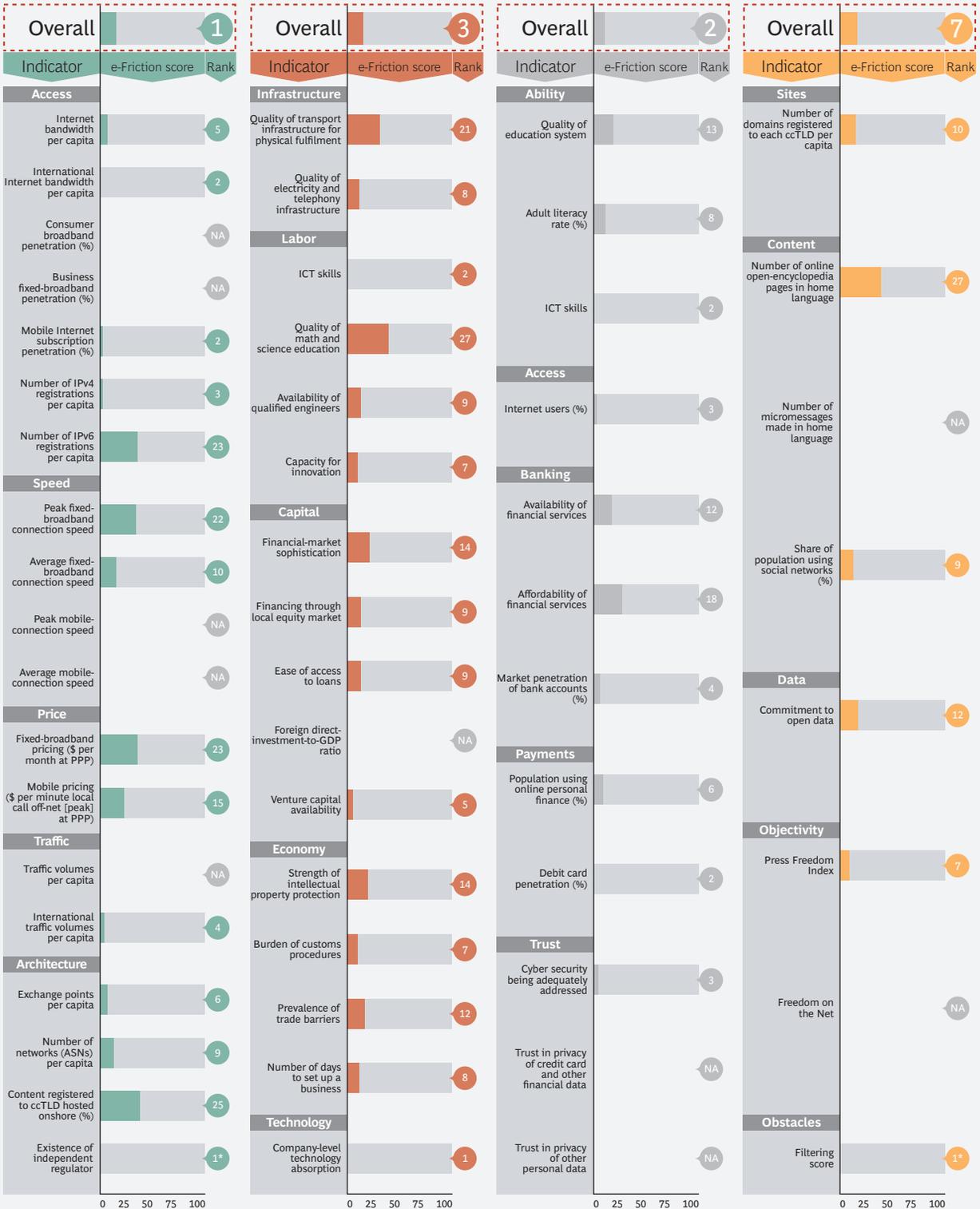
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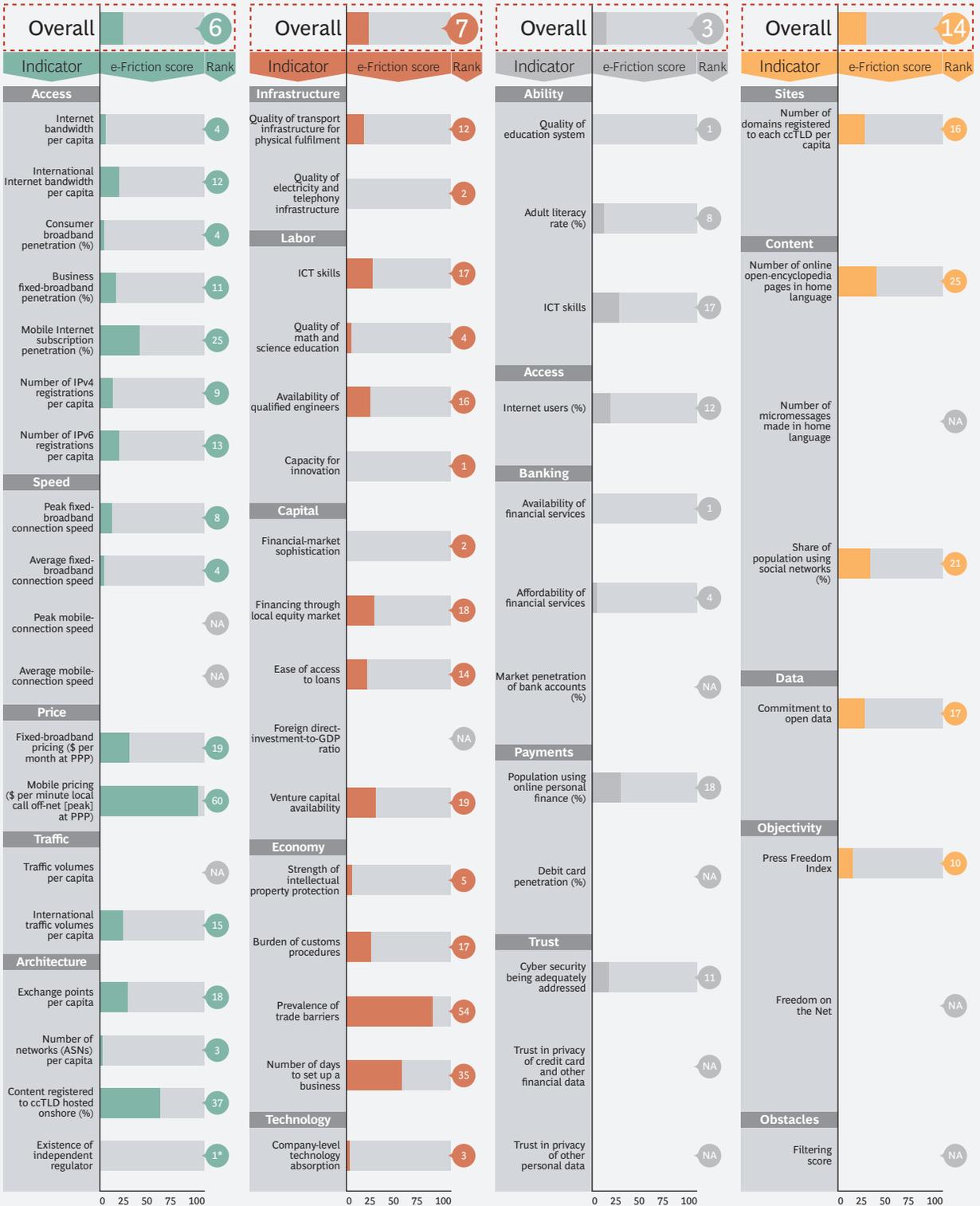


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Thailand

e-Friction Score: 64
Rank: 48

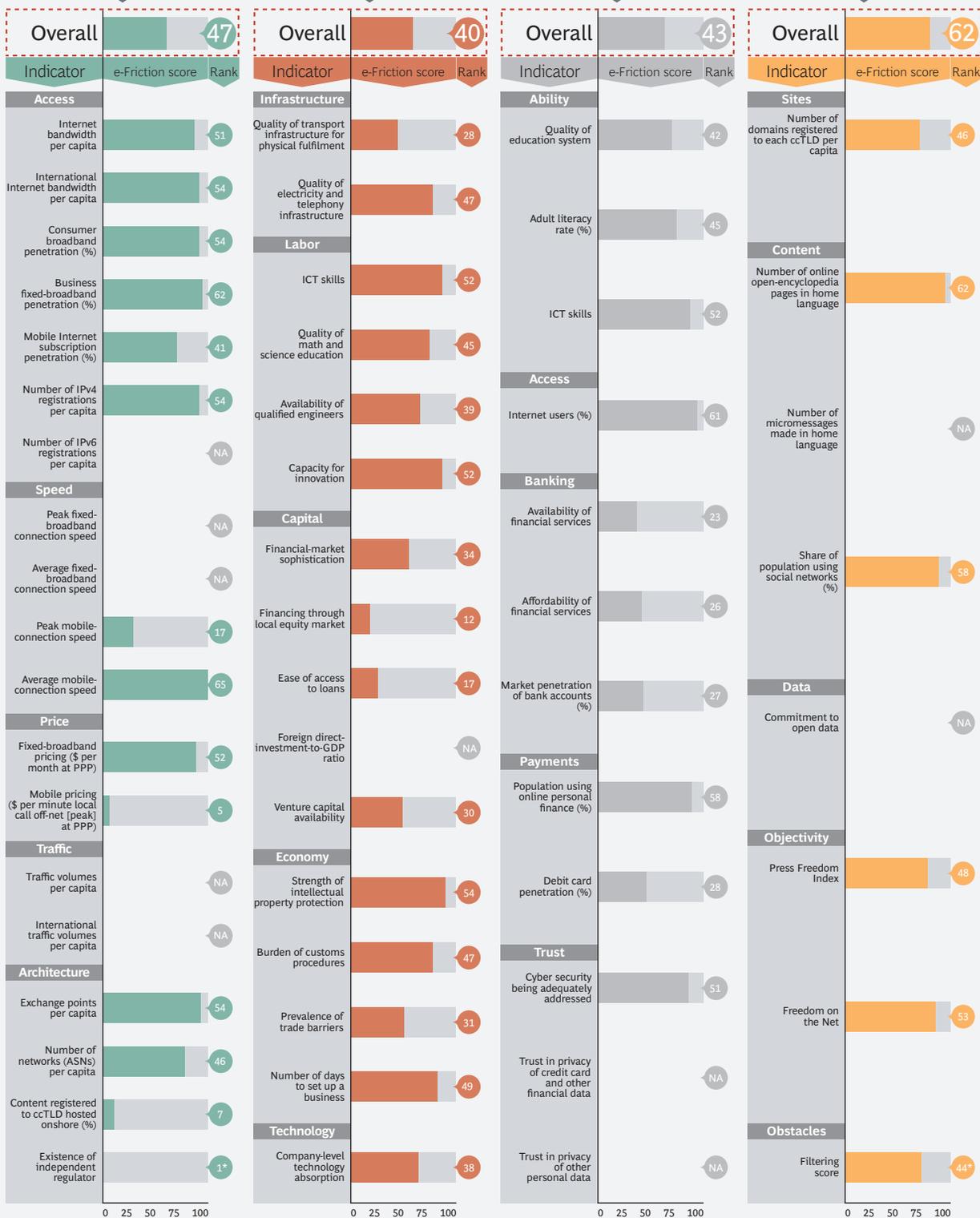


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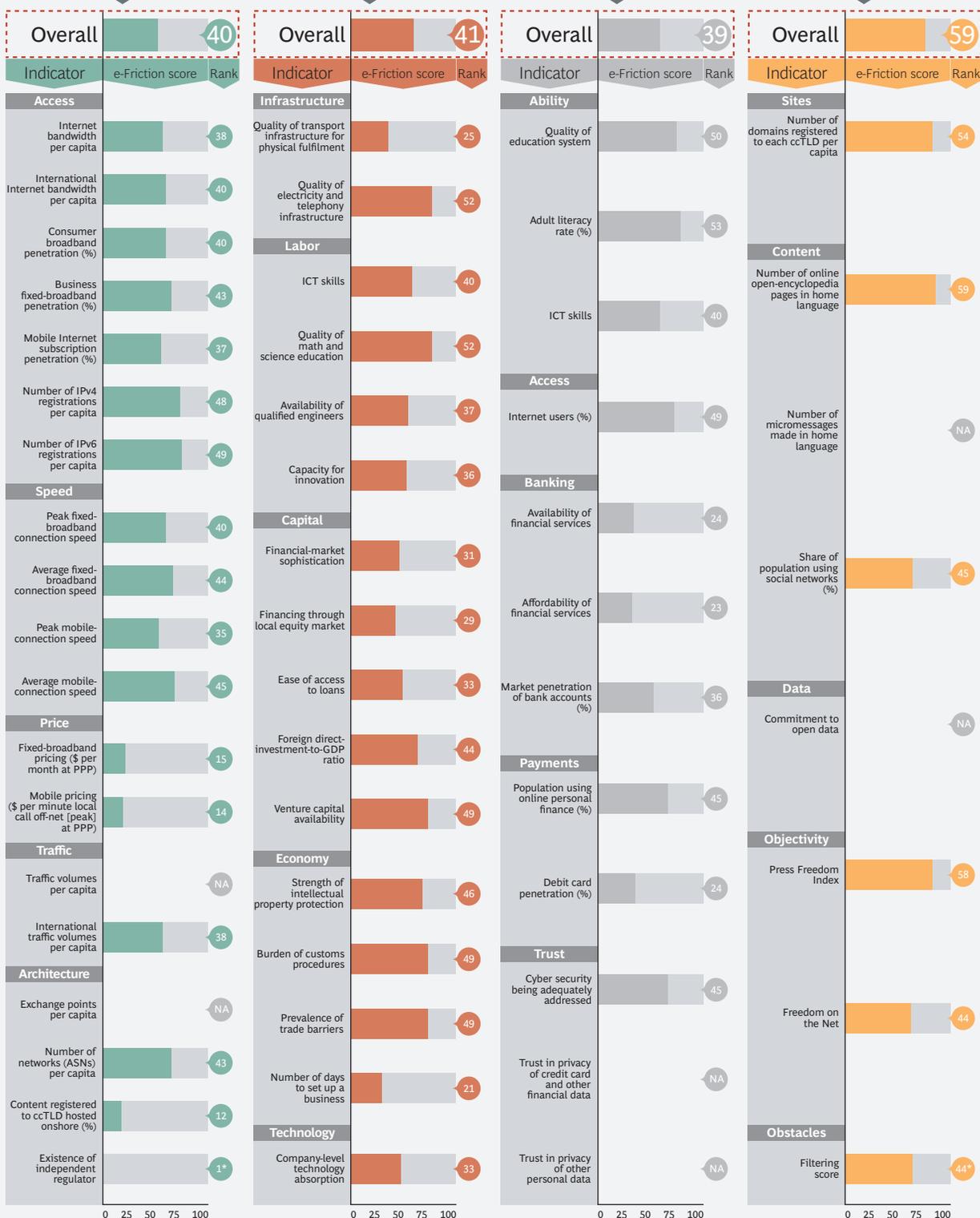


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Ukraine

e-Friction Score: 54
Rank: 39

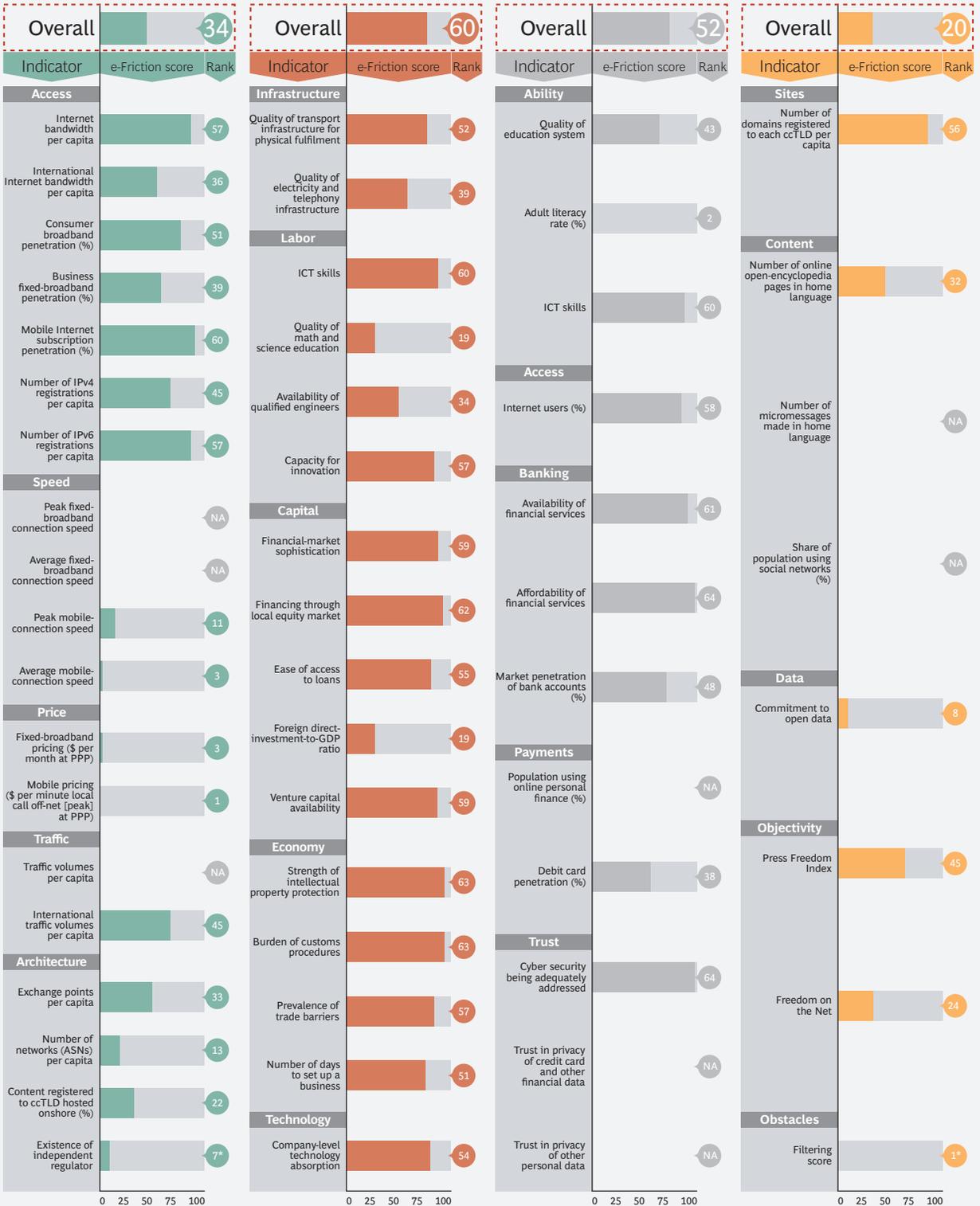


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United Arab Emirates

e-Friction Score: 41
Rank: 24

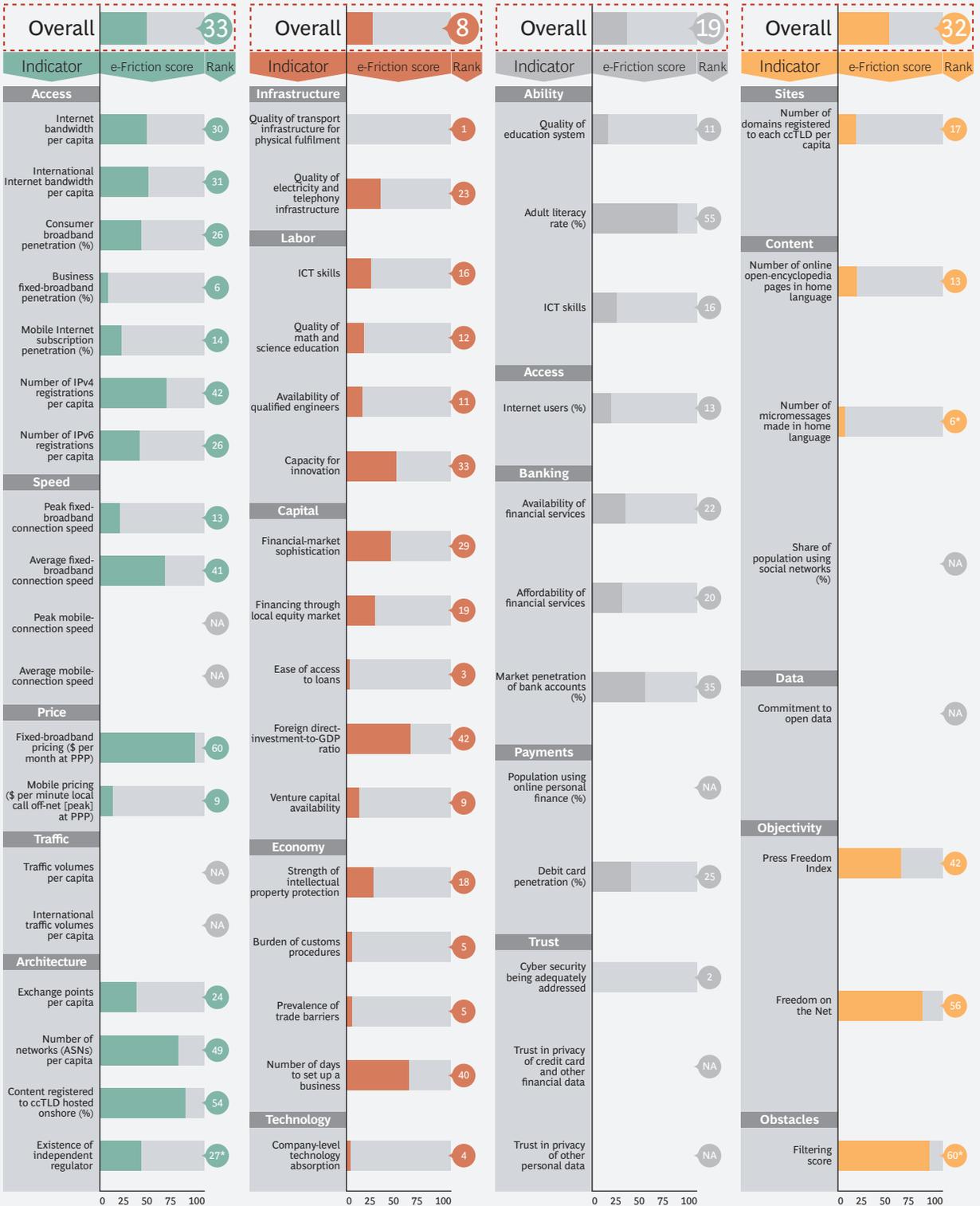


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United Kingdom

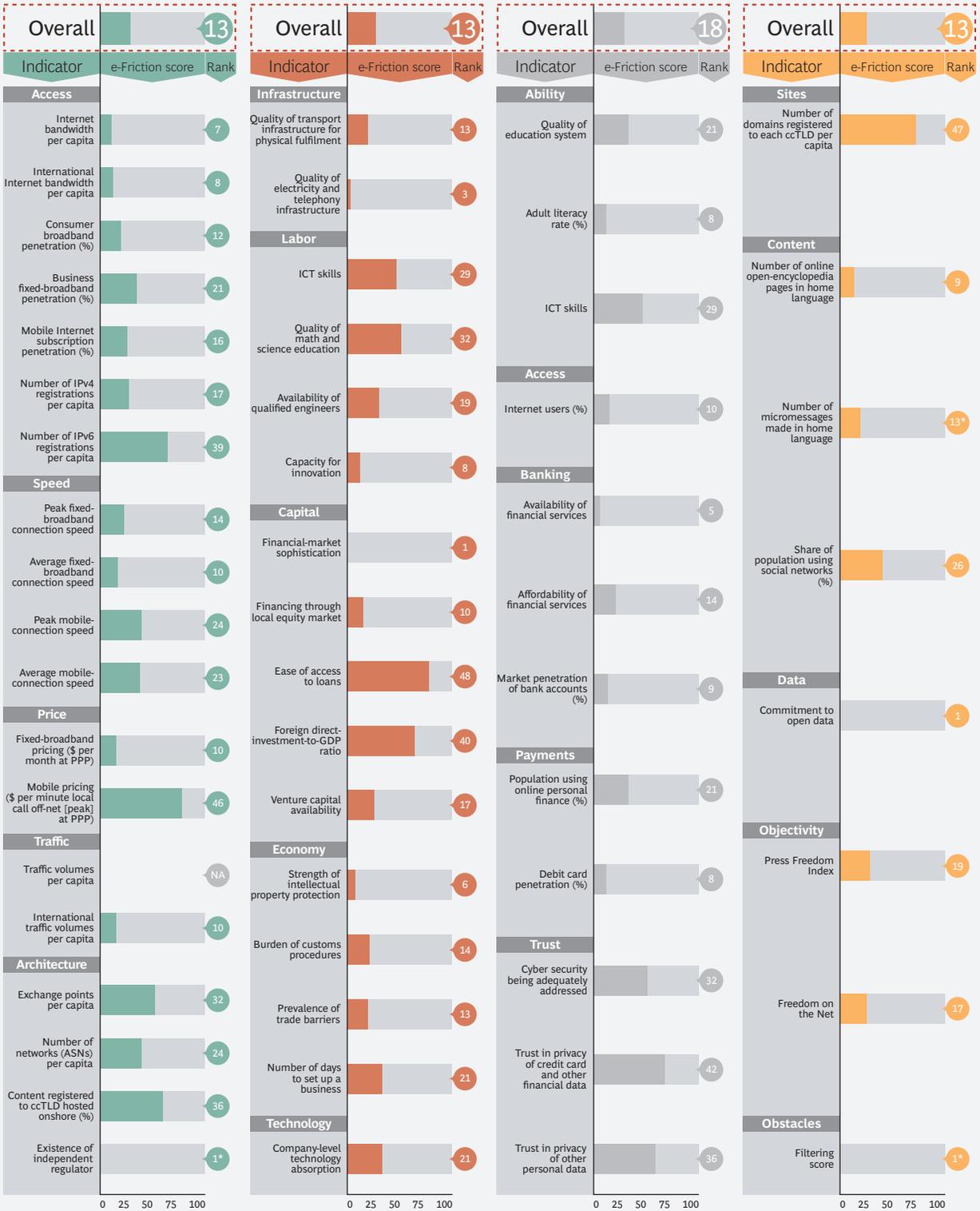
e-Friction Score: 28
Rank: 12 

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United States

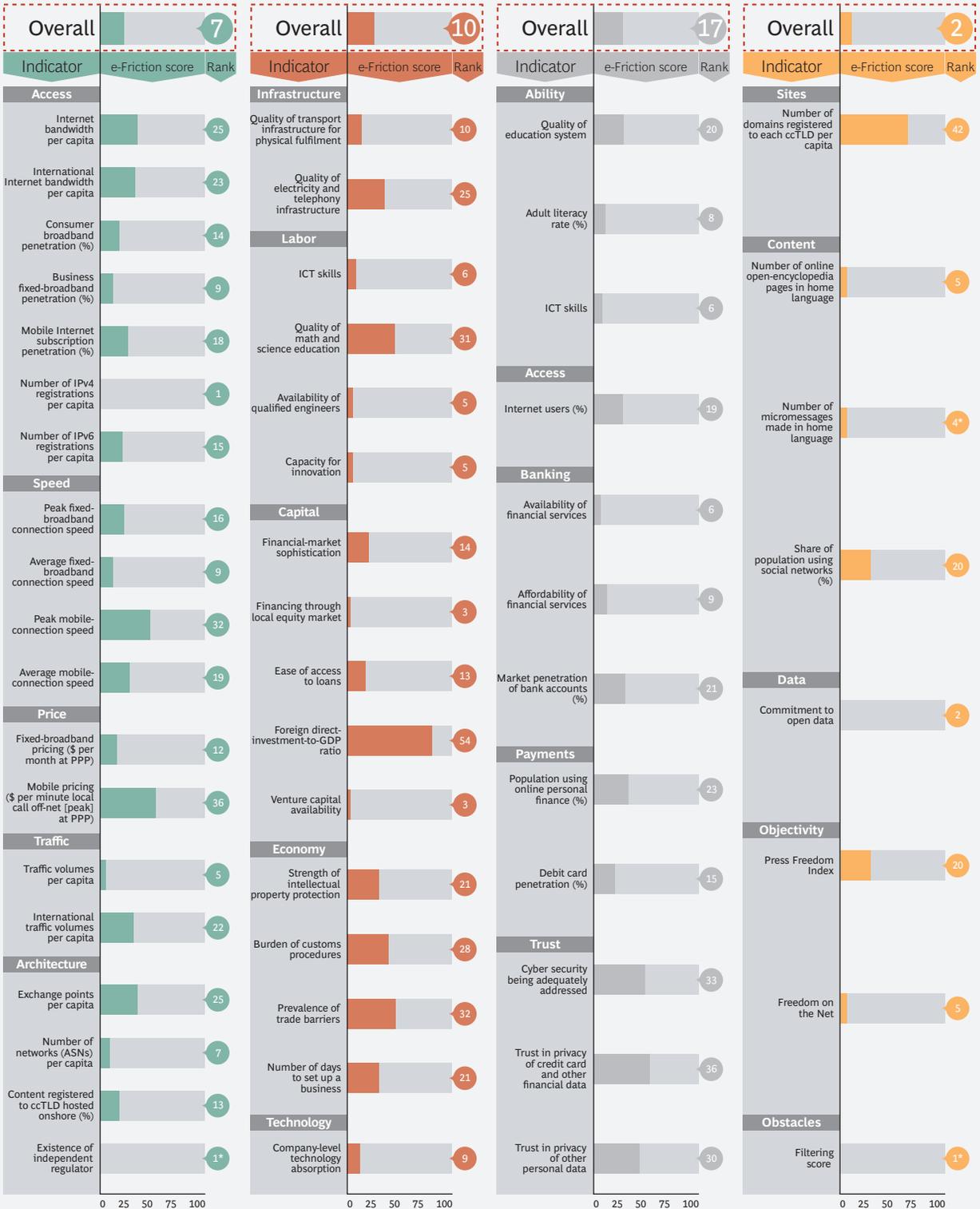
e-Friction Score: 22
Rank: 6 

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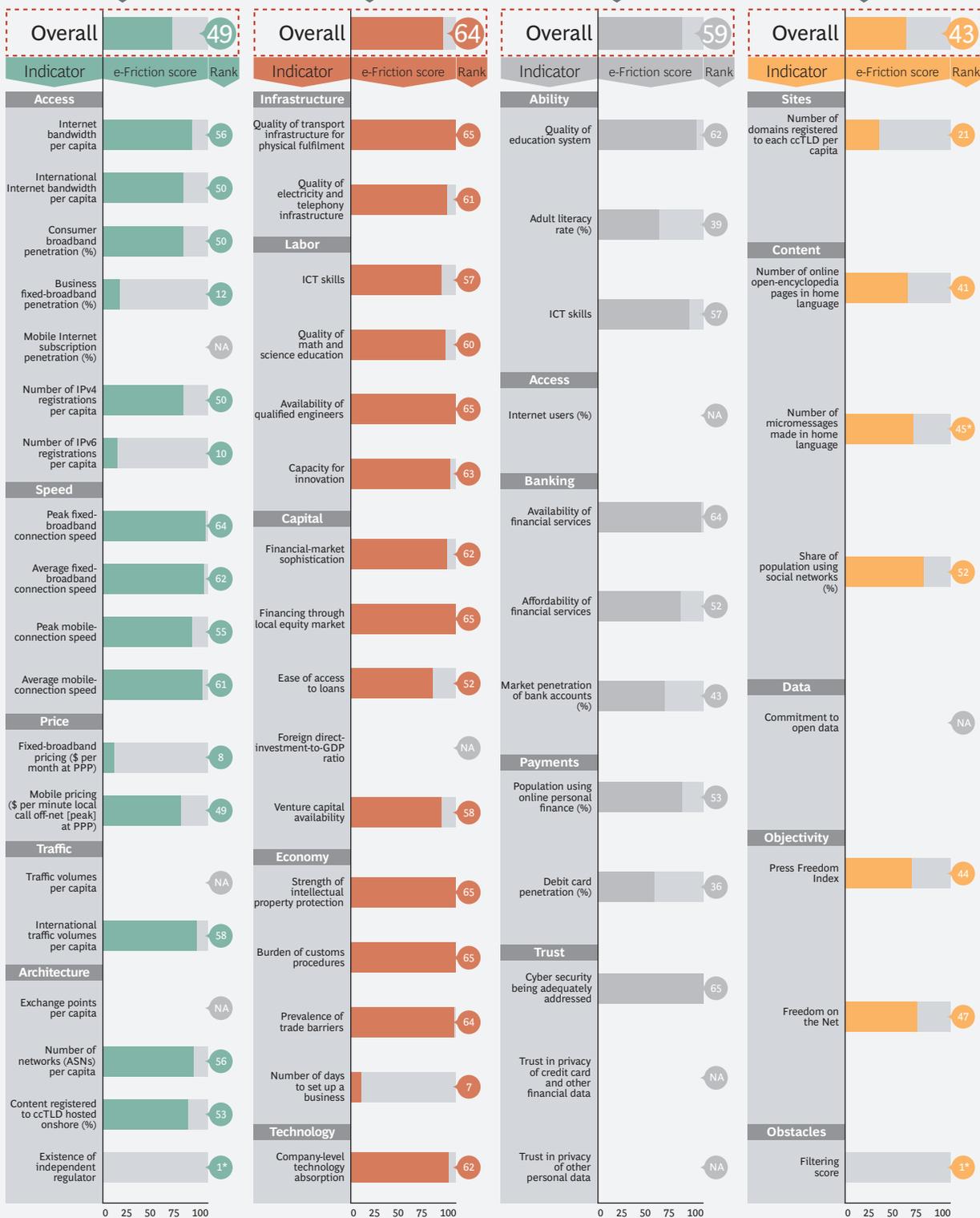


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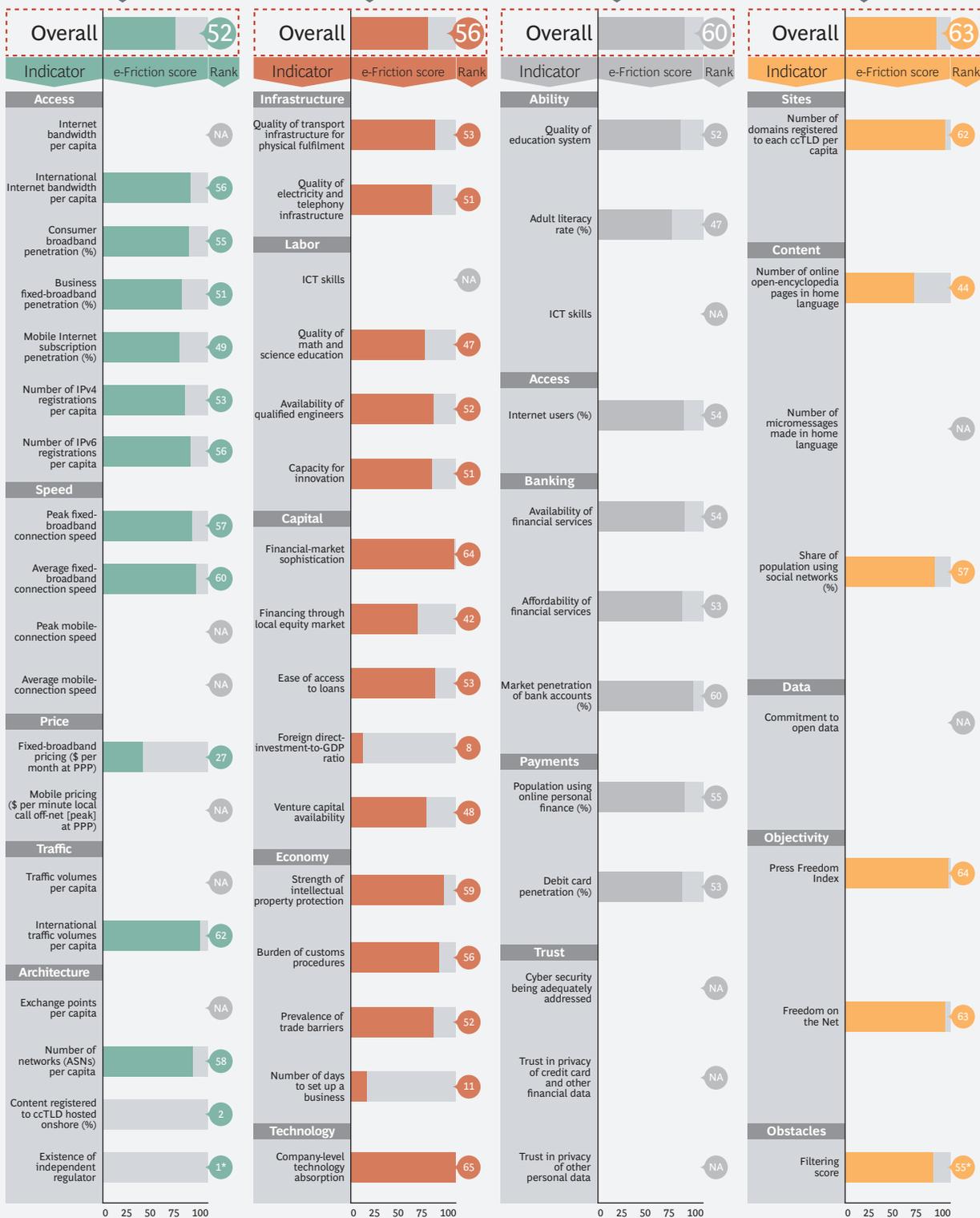


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NOTE TO THE READER

About the Authors

Paul Zwillenberg is a partner and managing director in the London office of The Boston Consulting Group and a leader in the firm's digital economy initiative. **Dominic Field** is a partner and managing director in BCG's London office and the global leader of the firm's digital economy initiative. **David Dean** is a senior advisor to BCG and a former senior partner and managing director in the firm's Technology, Media & Telecommunications practice.

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This report would not have been possible without the efforts of BCG colleagues Lauren Daum, Camila Penazzo, and Matthew Richardson. In addition, the authors are indebted to Philip Evans and to numerous other colleagues and external experts for their support and guidance.

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