Inter MEDIA

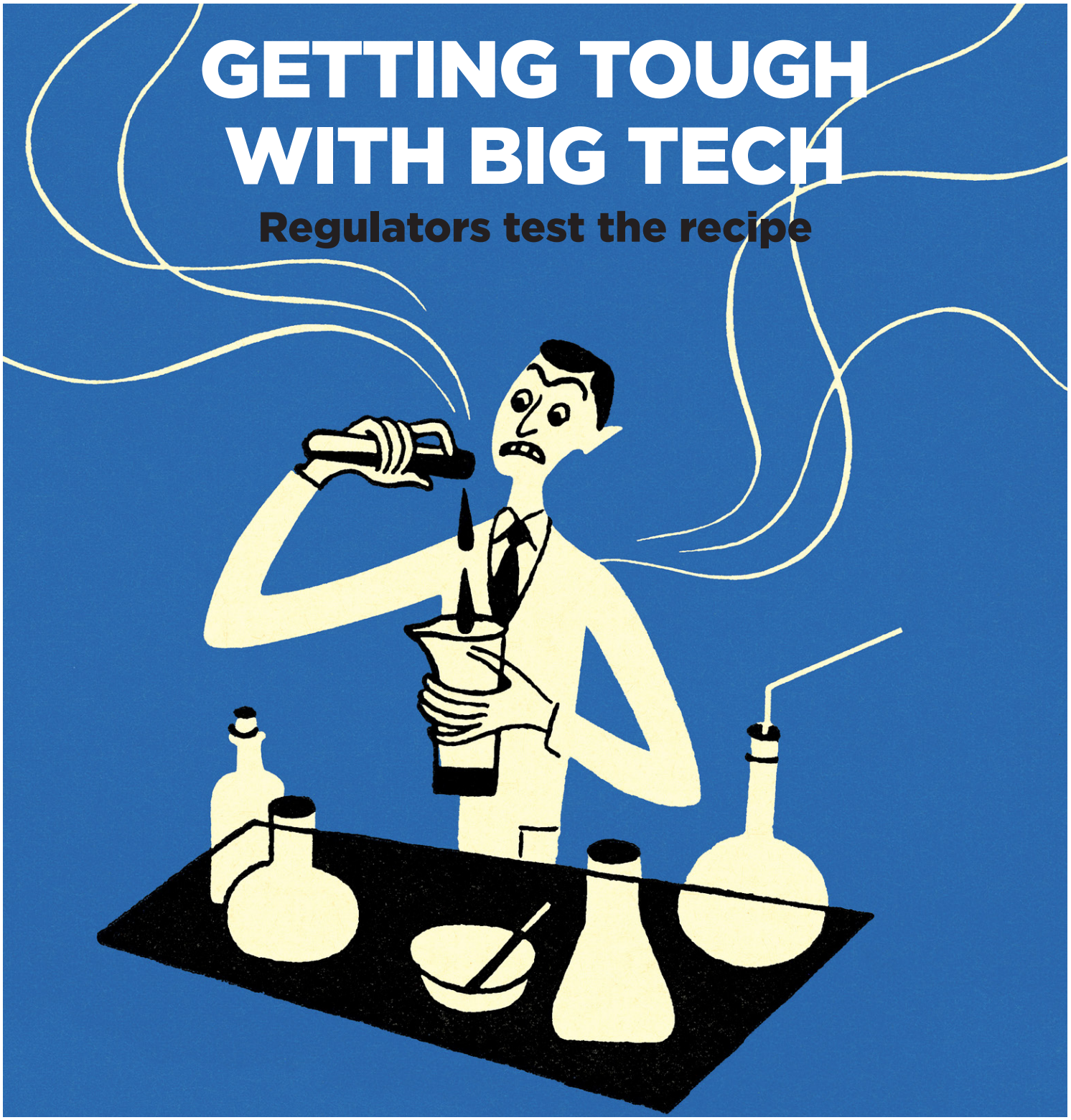
International Institute of Communications

THE WORLD'S MOST INFLUENTIAL TELECOMS AND MEDIA POLICY, REGULATORY AFFAIRS AND COMPLIANCE JOURNAL

MARCH 2023 | VOLUME 51 | ISSUE 1

GETTING TOUGH WITH BIG TECH

Regulators test the recipe



International Institute of Communications (IIC) Call for Board Candidates

We invite applications from members who are interested in joining the IIC Board of Directors.

The IIC Board anticipates proposing a slate of four new directors for election at the AGM in October 2023, which will take place in Cologne, Germany. This represents a new cadence for IIC board service and an opportunity to refresh the Board's membership, broaden its experience and bring new ideas to the table.

All IIC members are welcome to apply. The IIC is committed to both global and local inclusion and is seeking new directors from diverse backgrounds and geographies with experience across the digital ecosystem, including the identification of future leaders in this space. Youth is no barrier to selection; all are welcome.

If you think strategically and possess skills that will contribute to the IIC's continued success as a trusted, neutral and global platform for dialogue in this rapidly changing world, don't miss out on this opportunity to play a leading role in charting the future direction of the IIC.
Does this sound like you? Or do you wish to recommend a candidate for consideration? If so, please contact IIC Director General Lynn Robinson l.robinson@iicom.org

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The IIC is a neutral, non-profit organisation that aims to inform and shape the global policy agenda for the ICT and digital ecosystem. Its membership consists of leading regulatory bodies, policymakers and technology-led companies from around the world.

Closing date for applications: Friday, 14 April 2023 at 5pm GMT.

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A COMMON PURPOSE

While the AI bot ChatGPT is dominating most of the headlines, the EU's Digital Markets Act is quietly moving into its implementation phase. In its declared attempt to end the 'unfair practices' of the big tech platforms it adopts an ex-ante approach that Konstantinos Masselos, the chair of BEREC, describes as 'challenging'. (If you want to understand more about chiplets and get a night-time pudding recommendation, I commend to you his Q&A, published in this issue.) For some guidance on getting through the challenge, George Houpis and Tom Ovington of Frontier Economics offer some practical advice on one key aspect of the DMA, 'proportionality'. A wider perspective on the use of competition legislation around the world is the subject of the article by Tim Cowen and Sophia Yakhno in which they divine, with some vindication, that the piecemeal approach to regulation in this area is on the wane. Authorities and regulators are beginning to approach the issue with a common view and act with a common purpose. I like to think that the IIC has played a significant part in this, providing a neutral space for intelligent and sometimes passionate debate. If this is something you would like to contribute to, then I urge you to consider applying to be an IIC director. We rely on a board of experience, expertise and talent to help guide the organisation, and it's a rewarding and important role. You'll find all the details in the ad at the front of this issue and on the website.

Finally, a necessary disclaimer. While I recently took up a role as a director of ICANN, my comments here are made entirely in my IIC role.

Chris Chapman, President, IIC

www.iicom.org

The International Institute of Communications is the world's leading independent, non-profit, membership forum engaged with digital media policy and regulatory affairs. It is the policy platform for the digital ecosystem.

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NEWS
FROM AROUND THE GLOBE

Above: European parliament, Strasbourg

ARTIFICIAL INTELLIGENCE

EU ACT MOVES CLOSER

Work on the EU's new AI Act is thought to be nearing completion as lawmakers attempt to close negotiations with members of the European Parliament. The Artificial Intelligence Act is the EU's next flagship piece of regulation and the world's first attempt to regulate AI based on its potential for harm. The co-rapporteurs responsible for drafting the proposals, Brando Benifei and Ioan-Drago Tudorache, are reported to have agreed on a number of amendments:

- The requirement for AI developers to verify that the datasets used to train their model were legally obtained has been removed. This provision would have affected large language models like ChatGPT, which are trained by scraping data from the internet.
- References to the principles of data minimisation and data protection by design have been removed from the data governance requirements. The scope has been amended to remove open source AI models, except where they are part of a larger, higher risk system.
- The requirement for a fundamental rights impact assessment is understood to have been retained, but with a reduced number of elements and a carve-out for systems managing critical infrastructure.
- AI solutions that entail a 'significant level of risk', will have to undergo a conformity assessment procedure. EU lawmakers want the Commission to establish mutual recognition agreements with foreign countries with comparable conformity assessment levels.
- The ban on social scoring has been extended to include private entities.

Definitions are also under the spotlight. 'Significant risk' means 'significant in terms of its severity, intensity, probability of occurrence, duration of its effects, and its ability to affect an individual, a plurality of persons or to affect a particular group of persons.'

Legislators are said to have settled on a definition for AI itself that corresponds closely to that used by the OECD: '"Artificial intelligence system" (AI system) means a machine-based system that is designed to operate with varying levels of autonomy and that can, for explicit or implicit objectives, generate output such as predictions, recommendations, or decisions influencing physical or virtual environments.'

Full articles at bit.ly/3SZQTiZ and bit.ly/41QJmaa

SUSTAINABILITY

BATTERY TECH LEAP

The 1,000 mile range electric vehicle is now fully in sight with the development of a new lithium-air battery. In a joint project between the Argonne National Laboratory and the Illinois Institute of Technology, the design achieved a jump in energy density from 200 watt-hours per kilo (Wh/kg) to 675 Wh/kg, with the potential to reach 1200 Wh/kg. The technology offers the possibility of decarbonised transport in areas like trucks, trains and aircraft and would revolutionise the electric vehicle market. While a number of laboratories around the world are working on the next generation of batteries, this is the first time that such a level of energy density has been demonstrated and could, according to the paper released by the project team and published in the journal Science, 'finally match that of gasoline'. The battery needs no cobalt, removing reliance on mines in the DRC and Russia, and could, according to the team, be developed with the much more ubiquitous sodium instead of lithium. This would halve the potential energy density but would be cheaper, have no supply constraints and still double the range of existing batteries. The International Energy Agency forecasts a 20-fold rise in demand for lithium by 2040 based on the current trajectory.

The paper, 'A room temperature rechargeable Li_2O based lithium-air battery enabled by a solid electrolyte,' can be downloaded from pubmed at bit.ly/3l8vx6m

CYBERSECURITY

REDUCED INCOME FOR GANGS

Cyber-crime gangs have reportedly suffered a 40 per cent drop in earnings from ransomware attacks in 2022. Analysts at Chainalysis tracked money flowing in and out of crypto wallets known to be used by gangs, and found extortion payments of $457 million, versus $768 million in 2021. The real figure is likely to be much higher, but sources indicate that the drop is real, with cyber experts suggesting that companies are better at protecting themselves. Organisations are also better at backing up their data, and so less likely to pay ransoms. In addition, US sanctions against a number of Russian entities means that ransom payments can carry legal risks.

COMPETITION

COURT RULES IN ANDROID CASE

The Competition Commission of India has ordered Google to refrain from agreements that mandate pre-installation of its apps and ensure exclusivity of its search services. The company challenged the order in the Supreme Court, saying it would hurt consumers and its business. It warned growth of the Android ecosystem could stall and it would be forced to alter arrangements with more than 1,100 device manufacturers and thousands of app developers. Google said 'no other jurisdiction has ever asked for such far-reaching changes'. The company had also suggested that the regulator had copied parts of the order from a previous EU ruling on the dominance of its Android operating system. India's Supreme Court has declined Google's request to block the directives. Start-ups in the country welcomed the news as a 'boost for competition'. Google has said that it will cooperate with the Commission. 97 per cent of India's 600 million smartphones are estimated to run on the Android operating system.

REGULATION

EDPB TO BE SUED

Ireland's Data Protection Commission (DPC) has announced that it intends to take legal action in the EU Court of Justice against the European Data Protection Board (EDPB), accusing the body of overreaching its authority. The DPC claims that it came under pressure to extend an investigation into Meta to see whether the company was breaking EU data protection laws by forcing users to accept personalised online advertising, a move that Ireland says would be illegal. The split is highly unusual, and said to reflect a discomfort within the EU over the 'light touch' regulation Ireland is perceived to be applying to the many large technology companies headquartered in the country.

PRIVACY

GDPR UPDATE

The European Commission will propose a new law designed to improve enforcement of its privacy legislation, the General Data Protection Regulation (GDPR). Five years after its introduction, critics have noted the inefficiency in the system's ability to tackle major cases. Enforcement is heavily weighted towards bodies in Ireland and Luxembourg, where most big tech firms are headquartered. The new law will 'aim to harmonise some aspects of the administrative procedure in cross-border cases' and 'support a smooth functioning of the GDPR cooperation and dispute mechanisms'. It is due to be published in the summer.

5G

STRATOSPHERIC CONNECTIVITY

STC Group will use the Zephyr high-altitude platform station (HAPS) for direct-to-device 4G and 5G services in Saudi Arabia by the end of 2024. Zephyr is a solar-electric aircraft platform run by Aalto HAPS, itself owned by Airbus. The company describes its platform as able to deliver 'long-lasting, environmentally-friendly, low-latency 5G direct-to-device connectivity solutions'. On its last flight in 2022 it flew for 64 days, non-stop, in the stratosphere where it is above conventional air traffic. It acts as a 'tower in the sky', complementing terrestrial networks and able to be deployed to support critical events or natural disasters. STC says it plans to use the platform to expand its coverage in remote and rural areas.

IIC EVENTS

22-23 March, Brussels
IIC Telecommunications and Media Forum

3 May, London
IIC UK Chapter event: telecoms security

15-17 May, Miami
IIC Telecommunications and Media Forum

15 -16 May, Ottawa
IIC Canadian Chapter
Annual Conference 2023

16 -17 October, Cologne
International Regulators Forum 2023

18 -19 October, Cologne
IIC Annual Conference 2023

iicom.org/events/

IN BRIEF

Meta's independent Oversight Board has ruled that the company's nudity policy hinders inclusivity, after Instagram removed posts featuring transgender people with bare chests. The platform has been advised to change its policy 'so that it is governed by clear criteria that respect international human rights agendas'.

Microsoft is setting up a 'data boundary' in the European Union for its cloud customers. The move allows users to store and process data within the bloc. The boundary is being introduced in phases from January 2023.

China has issued guidelines for data management, designed to 'take advantage of the country's vast data and promote the digital economy'. The country will 'lower the bar for market entities to gain access to data', subject to protecting national data security, personal information and business secrets.

The tech industry association NetChoice has sued to block California's new Age-Appropriate Design Code Act. The law requires tech companies to design products and services with child safety in mind. NetChoice argues that the law is unconstitutional and provides too vague a definition of what's considered harmful.

Universities need to safeguard against the use of chatbots, according to a group of academics and education and cognitive consultants. The concern follows the emergence of ChatGPT, a language program that can imitate academic work and enable students to cheat on written work. The situation was compared by one academic as similar to the issue of mobile phones in schools: 'ignore it, reject it, ban it and then try to accommodate it'.

The European Commission has told its staff to uninstall TikTok from devices that use Commission apps. The measure is designed to protect data and systems from 'potential cyber security threats'.

Q & A WITH...

KONSTANTINOS MASSELOS, President of the Hellenic Telecommunications and Post Commission (EETT) and BEREC Chair for 2023

Q. WHAT GOALS DO YOU HAVE WHILE IN YOUR ROLE AS CHAIR OF BEREC?

A. My main objective as BEREC Chair 2023 is to contribute to BEREC's continuous efforts for independent, consistent and high quality regulation of digital markets for the benefit of European citizens. Our strategic priorities for 2021-2025 that will be addressed by BEREC's work in 2023, include promoting full connectivity, supporting sustainable, open and competitive digital markets and the empowerment of end users.
The successful implementation of the Work Programme 2023 is a challenge in itself as it is quite ambitious, including 51 projects, 13 of which start this year. New projects address trends such as 'wholesale only' tower and fibre companies, the phasing out of 2G and 3G networks, connectivity from low earth orbit satellites, migration to very high capacity networks and copper switch off, the entry of content application providers in the electronic communications market, 'cloudification' and 'softwarisation' of telecommunications, and the regulatory challenges of IoT.
Participation in the dialogue around the EC's connectivity package (the Gigabit Infrastructure Act and the Access Recommendations), is also a priority for 2023, achieving the ambitious European connectivity targets for 2030. This includes the ongoing discussion about who should contribute to network investments, which should be held in light of the European Declaration on Digital Rights and Principles. The last includes a statement that all market actors benefiting from the digital transformation should assume their social responsibilities and make a fair and proportionate contribution to the costs of public goods, services and infrastructures. It also emphasises the protection of a neutral and open internet.
Digital regulation will be also a priority for BEREC in 2023 through its participation in the High-Level Group, supporting the EC in the enforcement of the Digital Markets Act (DMA) and in the dialogue for the forthcoming Data Act.
Continuing the work on the definition of BEREC's strategic orientations and roadmap towards 2030 is also a key objective. Ongoing convergence of information and communication technologies – the 'I' and the 'C' of ICT – is blurring the border between them. This represents a major challenge for electronic communications regulators and needs to be taken into consideration when discussing the roadmap towards 2030.

Q. SHOULD MORE REGULATORS HAVE EXPERIENCE IN INDUSTRY AND ACADEMIA?

A. The role of regulator requires multidisciplinary skills, including law, economics, engineering, accounting and financial analytics. Regulatory decisions benefit from having a range of different professional skills and perspectives. Hands-on experience with established regulators can be particularly valuable; however both industrial and academic experience is important.
Working in industry generates skills and knowledge that are impossible to learn from textbooks and provides insights that are difficult to get from a non-industry perspective. By understanding how the industry and market work, it is easier to design regulatory frameworks of higher quality and enforce them more efficiently. Industrial experience brings other skills such as efficient teamwork, simplification of processes and efficient handling of challenging situations.
Working in academia requires initiative and the creation of robust and novel ideas. It builds experience in the management of resources such as funding and grant money, research personnel and publications. Academic networking is also important since we need to know who's who in our increasingly esoteric fields. In general, I strongly believe that academic experience should be valued as the equal of 'work' experience.

Q. THE EETT (HELLENIC TELECOMMUNICATIONS AND POST COMMISSION) IS BOTH THE REGULATORY AND COMPETITION AUTHORITY FOR THE TELECOMMUNICATIONS SECTOR – HOW MUCH DOES YOUR ROLE OVERLAP WITH THE HELLENIC COMPETITION COMMISSION, FOR EXAMPLE IN CONSIDERING REGULATION OF LARGE PLATFORMS?

A. Indeed, EETT is both the regulator and the competition commission for electronic communications and postal markets with exclusive competence in these fields.
Although our model is not common to other EU and OECD countries, I strongly believe that there is no one-size-fits-all model in the institutional arrangements for competition enforcement. A regulator developing competition skills brings significant advantages, as it allows a) building on the sector-specific acquired expertise, b) enforcement of an optimal mix of competition law and regulatory tools, and c) more efficient consideration of competition principles when issuing regulatory frameworks.
The EU regulatory framework for the electronic communications sector, as recently codified with the European Electronic Communications Code (EECC), already includes many competition law principles, which means that a number of critical decisions need to be made by the regulator with a view to establishing a competitive landscape.
The assignment of exclusive competition law enforcement powers to the EETT (both for national and EU competition legislation) for the electronic communications and postal markets means that there is no overlap with the role of the Hellenic Competition Commission in these two markets. In the case of digital platforms, the DMA enforcement mandate is mainly with the European Commission. Most recently the EETT was acknowledged as the sectoral competition authority for the DMA. With regards to the DSA, no significant role is foreseen at the national level for the competition commissions, but in several EU Member States, electronic communications regulators are considered most suitable for the role of national coordinator.
The path of cooperation is and has always been an essential and conscious choice for the EETT, whether with independent authorities and sector specific regulators, on a national basis, or with the public authorities of other EU Member States and countries around the world.

Q. THE OBLIGATIONS UNDER THE DIGITAL MARKETS ACT BEGIN TO TAKE EFFECT DURING THIS YEAR – WHAT ARE THE MAIN PROBLEMS YOU SEE WITH ITS INTRODUCTION?

A. We consider the introduction of the DMA as challenging. It is an innovative, hybrid model of competition legislation, which makes use of ex–ante regulatory tools. But we strongly believe that any difficulties related to the first stages of its implementation will be overcome.
BEREC will continue to contribute to the implementation of the DMA as a member of the High-Level Group, which provides advice, expertise and recommendations on its implementation and enforcement.
Article 7 of the DMA includes an interoperability obligation for number-independent interpersonal communication services (NI-ICS), stating that a gatekeeper must make the basic functionalities of its NI-ICS interoperable with the NI-ICS of another provider. The gatekeeper must publish a reference offer laying down the technical details and general terms and conditions of interoperability with its NI-ICS, including the necessary details on the level of security and end-to-end encryption. In recital 64, the DMA also sets out that the European Commission may consult BEREC to determine whether the proposed reference offer complies with this obligation.
Interoperability measures for NI-ICS are also included in the EECC. BEREC will provide an overview of the economic and behavioural features of NI-ICS and the state of the market for these services. The report (due in June 2023) will also present different interoperability approaches and propose potential solutions. It will analyse the provisions and conditions for application and implementation under both the DMA and the EECC, and will also consider the interplay between the two legislative frameworks.

“We consider the introduction of the Digital Markets Act as challenging.”

Q. IN ITS SUBMISSION TO THE EUROPEAN COMMISSION BEREC HAS REJECTED THE SUGGESTION THAT DIGITAL SERVICE PROVIDERS SHOULD BE REQUIRED TO CONTRIBUTE TO THE COST OF BUILDING NEW NETWORKS. HOW DO YOU VIEW THE ARGUMENT THAT THE COSTS OF NEW INFRASTRUCTURE ARE TOO HIGH TO BE BORNE EXCLUSIVELY BY OPERATORS? WHAT CAN REGULATORS DO TO HELP?

A. BEREC in its preliminary assessment in October 2022 focused on the implementation of a ‘direct compensation’ (sending party network pays, or SPNP) mechanism from content application providers to telecommunication networks operators. BEREC has found no evidence that this is justified given the current state of the market and that such a mechanism could present various risks for the internet ecosystem. In practice this means that BEREC found no reason to alter the conclusions of its previous study of 2012 (and 2017).
However the issue is, in my opinion, broader. The European Union has set very ambitious objectives with regards to very high capacity

networks (VHCNs) deployment towards 2030. The deployment of such networks, such as 5G and FTTH, is capital intensive. Regulators should develop policies to encourage investments and at the same time address the demand side to make networks financially viable in the long term as well as accessible to consumers – services need to be competitively priced.

Different policy approaches can be used to reduce network deployment costs and mitigate investment challenges. These include development-friendly spectrum assignment processes, encouraging infrastructure sharing, supporting the use of the right technology hybrid (fibre to the home, fixed wireless access, satellites), strengthening passive infrastructure access, and frameworks to reduce civil engineering costs and promote open access networks. Public funds will be necessary to address network deployment in areas of less commercial interest. For example, only densely populated areas can go to FTTH without the use of subsidies.

Q. DO YOU SEE OPPORTUNITIES FOR GREATER HARMONISATION OF REGULATION AROUND THE WORLD? SHOULD REGULATORY BODIES COOPERATE MORE FORMALLY, AS THEY DO IN BEREC?

A. Harmonisation of regulation is important since it removes inconsistencies that create unnecessary and burdensome barriers. Achieving harmonisation is nevertheless a challenging task given the specifics of different countries and markets, and flexibility should always be preserved.

International collaboration of regulators is important, given the increasing convergence of issues across different regions of the world. This convergence, as well as the global nature of electronic communications services, means that policies, legislation and regulation must be seen from a more global perspective.

Institutions such as the International Telecommunication Union (ITU) and the OECD can play an important role in promoting international collaboration among regulators from different regions of the world and exploring the wider opportunities for harmonisation. BEREC benefits from the cooperation with NRAs and with other international regulatory institutions, including Regulatel, EaPeReg and EMERG, which are all involved in communications issues beyond the territory of the European Union.

Q. WHAT ARE THE TECHNOLOGIES ON THE HORIZON THAT EXCITE YOU THE MOST?

A. The number of applications of artificial intelligence and its variants like machine learning, deep learning and convolutional neural networks is huge and covers almost all aspects of our lives. Integrated circuits set the foundations of this evolution. This makes the semiconductor industry a very strategic industry for a country (or even big corporations) NOT to participate in.

By the mid-2000s, the semiconductor industry ceased to be able to scale silicon speeds at the pace it used to three decades prior to that, and by the mid-2010s introducing more cores to CPUs ceased to deliver measurable returns. The industry, in order to keep up with our need to process more and more data, paradigm shifted to heterogeneous or 'accelerated' computing. During the last 3-4 years, these special-purpose computing pieces of silicon, typically targeting AI or networking stack acceleration tasks, started to get fabricated in independent chips that we call 'chiplets'. In the near future, choosing the right mix of chiplets per application and properly interconnecting them – what the industry calls 'advanced packaging' – will probably become more important than the technology of the chiplets themselves. System-scale on silicon always wins!

> **The number of applications of artifical intelligence and its variants like machine learning...is huge and covers almost all aspects of our lives.**

This, I believe, is a big opportunity for smaller European countries to get into the semiconductor business. By standardising chiplets and maybe by getting a small piece of our planned semiconductor spending made accessible to innovative SMEs around Europe, they can come up with chiplet interconnect and advanced packaging solutions. I think it is needed, in order to democratise access to this key technology.

QUICKFIRE:

What was the last book you read? North and South by John Jakes (I have read it several times). Mission impossible is accomplished at the end of Book 2 for two people really in love.

What song would you like played at your funeral? Truly Madly Deeply – Savage Garden. Great music - superb lyrics.

Starter or pudding? Chocolate pudding. I always eat chocolate before going to sleep.

What's your favourite holiday spot? Messenia in the southwestern part of the Peloponnese region in Greece.

What's the first item you'd save if your house caught fire? My data/hard disk. This is the era of the digital economy.

COVERING THE WORLD

Broadband rollout and international policy cooperation were front and centre of the debate at TMF in Washington, DC. **RUSSELL SEEKINS** reports

Mid-December saw the IIC's final event of the year take place in Washington, DC. Speakers, panellists and delegates gathered from North America and across the globe to assess the current state of broadband plans, the associated issues of security and privacy and the role of the ITU. The TMF was hosted by Verizon and sponsored by Netflix.

BROADBAND ROLLOUT

The strategy for broadband in the US is described as 'all of the above', with the target of 100 per cent coverage. It was necessary, said one speaker, to avoid the 'false choice' between broadband availability and affordability – regulators had to ensure both if the digital divide is to be closed. The Affordable Connectivity Program (ACP) is the country's largest broadband effort, in which low-income households receive subsidies both for equipment and monthly usage. 15 million households are participating, and the current effort is to ensure that the message is spread more widely. The new infrastructure law is resulting in record investments, supported by new broadband maps showing the availability of the internet across the country. Wireless service is being addressed through recent spectrum auctions, with the bulk of the licences for rural areas.

A panellist described the arrival of 'a different space age', with developments not only in low earth orbit (LEO) satellites, but higher geostationary systems and hybrids. These are coming together in a dynamic mix to meet coverage, capacity and latency needs. The opportunities have been recognised at the FCC, which has established its own space bureau designed to keep pace with the emerging space economy and improve international coordination.

In the US, the FCC has now published a list of equipment deemed an unacceptable risk to national security and prohibited the use of universal service funds to purchase them. This sits alongside a programme of reimbursement for the removal of untrusted equipment from networks and an order banning the importation of such equipment. Further steps include proposals on data breach reporting, emergency alert systems and on internet routing.

5G fixed wireless access is the fastest growing broadband in the US, with a million homes and businesses using it as their primary service, in urban and suburban areas, as well as rural ones. Licensed spectrum is especially valuable for the task, along with a harmonised international spectrum policy if the innovation potential of 5G and 6G are to be realised effectively. It enables, she said, network operators to make key investments with confidence.

SUPPLY CHAIN DIVERSIFICATION

Another presenter emphasised that innovation required spectrum. In the US the NTIA coordinates federal spectrum for government agencies while the FCC is responsible for commercial spectrum. These two bodies are working together on a more formalised cooperation agreement that will have the re-purposing of efficient spectrum as a priority. The World Radiocommunication Conference later in 2023 (WRC-23) will treat spectrum management and harmonisation across countries as a priority. The NTIA has also conducted a '5G Challenge' designed to promote interoperability in equipment and supply chain diversification by encouraging new entrants.

The efforts at diversification include the 'Chips Act', which incentivises the manufacturing of semiconductors, but which also provides a $1.5 billion innovation fund designed to accelerate Open RAN adoption. Open RAN is seen by US administrators as the technology of the future, and there is a commitment to ensuring that it becomes a viable, competitive option for markets around the world.

It was noted that, around the world, many countries were continuing to use equipment now on the banned list in the US. For many of these countries, a 'rip and replace' scheme similar to that in the US is not an option.

ESSENTIAL COORDINATION

One panellist pointed out that, with more public organisations involved in funding broadband in the US, including the NTIA, FCC, USDA and treasury department, coordination between them would become even more important. The services themselves may be spread between a range of providers, with some programmes emphasising local government or non-profit solutions, and geographical coverage will also need careful coordination. A panellist from a federal organisation pointed to the bipartisan support for the Digital Equity Act. The aim of 100 per cent connectivity would need the participation of all providers within each state, municipality and region. Technology neutrality was also going to be important and this, said another panellist, is a challenge that remains to be addressed.

ADOPTION

A panellist described how the core of the Broadband Equity, Access and Deployment Program (BEAD) was adoption, and that this meant fusing subscription

with 'meaningful use'. Even when provided free, many older people see no use for the internet. She described an example of using a plant app to engage a senior citizen interested in their garden. Many panellists agreed that, while a budget of $48 billion dollars for the entire programme was a record, it was probably still not enough, especially when considered at the state level.

One contributor suggested that network-building lacked sustainability, as new capacity is simply absorbed by new products and services, requiring the building of yet more capacity. He argued that a more balanced approach between network and content providers was needed, including changes to net neutrality. A panellist responded by pointing out that large tech companies are engaged in significant investment in connectivity too, and that the modern internet is a 'network of networks'. It was noted that, as traffic has grown, ISP costs have remained stable.

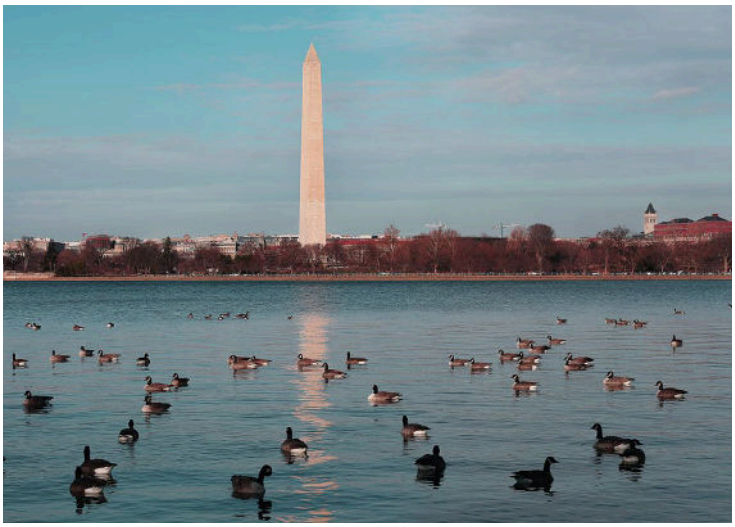
BEYOND THE US

In Canada, over 90 per cent of homes have access to '50 down, 10 up' connectivity, supported by the conversion of the USO fund to a broadband development fund. But in indigenous areas it is 20 per cent and adoption levels are low. In Africa, connectivity has been transformed by undersea cables, with 37 coastal countries serving their own and inland states. 'Last mile' is a particular issue, and the reason why so many connections are slow. There are problems of digital literacy across Africa, and at a cost of $130 per month for a home connection, broadband isn't affordable for the 40 per cent of the population that live on less than $3 a day. Governments aren't in a position to fund the infrastructure necessary to bridge the digital divide, and rely on private partnerships. This approach is working well in some countries, including Botswana and Rwanda.

In Latin America the picture is that, while mobile broadband of some sort covers 95 per cent of the region, only 40 per cent of the population is connected due to a lack of affordability and digital skills. The region depends mainly on private sector funding for building networks and with costs, especially spectrum costs, relatively high, more companies are focusing on where they can see a return. In some cases these companies have abandoned their assets altogether. One panellist pointed to metrics indicating that countries with the highest spectrum costs per capita develop networks more slowly.

INTERNATIONAL FORA

The discussion on the status of international fora and meetings focused on the role of the ITU. Participants welcomed the election of Doreen Bogdan-Martin as secretary general, but concerns



remain over the challenge from some countries to the multi-stakeholder versus multilateral (or 'top-down') model of governance. This included attempts to involve the ITU council in a greater internet role, directly affecting the mandates of technical organisations responsible for global standards. Although rejected by member states so far, it is expected that the same countries will continue to submit proposals designed to change technical aspects of the internet.

One panellist described concerns at the UN that standards development organisations are operating unilaterally. The forthcoming Global Digital Compact will include efforts to ensure mutual awareness of policy, as well as interoperability issues. Another view was that the ITU needed a broad input of contributions, including from industry. This was sometimes seen as 'mission creep', and there is hope that the new leadership will encourage renewed engagement. It was also expected that the ITU would begin to consider spectrum for 6G, with studies available by 2027 in anticipation of equipment readiness in 2029.

> **"Broadband isn't affordable for the 40 per cent of the population that live on less than $3 a day."**

RESPONSIBLE AI

The debate on artificial intelligence was set against the issues of trust, visibility and risk. One panellist described concerns over the bias in natural programming language, which tended to favour standard over minority forms of speech. This, she said, could affect a range of issues such as whether a loan was approved or a job offered. It is important, said another contributor, to differentiate between types of bias – computational and statistical, as well as systemic. They described the process of

bringing into being a federal AI risk management framework and argued for a culture shift in how risk is discussed, understood and assessed. This involved understanding the taxonomy of risk, balancing the scale of benefits against possibilities of harm, and defining the desired characteristics of a trustworthy AI system. The framework had received inputs from 200 organisations, and would be released in January 2023, consistent with the congressional mandate, but would remain voluntary. Another panellist explained the findings from their 'Accountable AI' project, focused on addressing risks and concerns without stifling the benefits that AI brings. He pointed out that there were situations in which the risk may be high, but acceptable when weighed against the scale of the wider benefit to society.

'HUMANS IN THE LOOP'

There was a wide discussion on the importance of human involvement, especially in the case of appeals and redress. One panellist pointed out that this needed to take account of context. For example, denial of entry into a country requires immediate human review, music recommendations don't. Issues of liability are also significant, in particular how they are divided between supplier and producer, and the distinction between controller and processor in the use of data. In some countries, activities like job application screening are being classified as 'high risk AI', with all the consequent demands of human intervention and redress. It was agreed that more work was needed in the area of liability and giving effect to individual rights.

CROSS-BORDER PRIVACY RULES

The debate began with a panellist outlining the value of cross-border data flows, citing financial benefits for micro-SMEs and the sharing of information on cyber-attacks as two examples. Data transfer is at the core of today's global economy and regulations such as those in China and the GDPR can be expensive to comply with as well as restrictive. Controls on data flows are necessary in some cases, but must not be discriminatory or protectionist.

A panellist from a large technology firm explained the EU's approach to data in terms of its founding principles and the rights of citizens to have their data protected. Other countries have copied this, not because they share the principles, but for trade purposes. The idea that data is an asset that can be capitalised is driving the approach seen in many countries towards hard data localisation, or local storage mandates. Evidence shows, she says, that this approach is economically harmful, even in its looser form of 'local data duplication', i.e. keeping a copy of data locally. Addressing this means addressing the frustrations over access and law enforcement that lead to this world view, as well as the idea, prevalent in countries like India, that keeping data national will limit 'big tech' and facilitate the creation of 'national champions'.

FLEXIBLE VS TOP-DOWN APPROACH

Another panellist presented a government perspective and the latest adequacy agreement reached between the US and EU. For many countries the GDPR represents a complicated 'top-down' approach to privacy, and the Cross-Border Privacy Rules (CBPR) are now becoming more global. It is based on the same principles as the European Directive, but is more attractive to countries that want the same level of protection and enforcement, but greater flexibility. However, implementation of this approach is less defined, especially for countries without an established process of data protection.

CYBERSECURITY

The issues in cybersecurity will continue to centre on the protection of critical infrastructure, the risks from high-risk vendors and the need for continuing capacity-building, but one panellist pointed to the emerging challenge from quantum computing. It was suggested that quantum systems could be operational within 7 to 10 years and will then quickly be able to overcome existing encryption standards. This was described as a potential 'y2k' moment, and one that is beginning to appear on the agenda of intergovernmental meetings. Increasingly, cybersecurity is seen as a component of the 'E' in ESG scoring, and is of growing interest to ESG investors and therefore financial directors, said one contributor.

A DRIVE FOR STANDARDS

One concern was the extent to which many parts of the digital ecosystem are unregulated with respect to cyber, and the ease with which the whole system could potentially be brought down. Singapore has pioneered the certification of IoT devices, but it is currently voluntary in most sectors. The EU has a system which designates critical technologies according to levels of risk and applies certification requirements according to sensitivity, but to standards designated by the European Commission.

Some parts of industry are responding. The Consumer Technology Association has created a taxonomy around current developments and due diligence requirements across 50 separate product groups. This is forming the foundation for discussions with the US government on conformance certification and the potential for a 'seal of approval' on products themselves.

DEBATING FUTURE POLICY IN OTTAWA

The IIC's 53rd Annual Conference took place in November 2022 in Ottawa, Canada and followed the International Regulators Forum. **CRISTINA MURRONI** provides a flavour of the debate

Senior industry representatives joined regulators, academics and other stakeholders from the telecoms, media and technology communities for two days of discussions on the major issues facing the sector. The conference was hosted by the Canadian Radio-television and Telecommunications Commission.

SPECTRUM POLICIES FOR THE FUTURE

As the range of digital services reaching the market continues to expand, spectrum demand will grow. Technological advances make it possible to use parts of the spectrum that were deemed unusable before and has spawned new spectrum users and use cases. According to one regulator on the panel, this has made the current ITU processes, often slow and difficult to navigate, unfit for purpose. A renewed focus on international harmonisation at the Word Radiocommunication Conference, away from geopolitics, is important in planning for new technologies.

Another regulator highlighted the importance of developing a competent mix of licensing models, rather than try to impose a single approach. Each licence should be designed to accommodate the business models and entry needs of different use cases, at the same time as addressing downstream competition risks and facilitating entry.

Spectrum sharing emerged as a key topic: a global vendor invited regulators to focus on solutions that prioritise simplicity, efficiency and accuracy when developing approaches. There was wide consensus that a structured mechanism for sharing best practice in this domain would be beneficial. In addition, regulators' databases are often inaccurate and there should be incentives for operators to provide up-to-date information. Currently operators have every incentive to leave old information in regulatory databases, preventing new entrants from being able to use the spectrum and thus compete.

Every new generation of wireless networks brings new capabilities, remarked a representative from one operator, but with 5G networks there is an unprecedented shift away from consumers and towards the industry. This offers radically new use cases. Regulators need to help service providers combine legacy spectrum with new allocations. Allowing them to build spectrum blocks will increase efficiencies and ensure the full requirements of the new use cases are incorporated.

CYBERSECURITY: BEHAVIOURS AND TRUST

'If cybercrime were a country, its GDP would be the third largest in the world, after the US and China.' A speaker from a major mobile network operator stressed the importance of regulators understanding the nature, size, and scale of cybercrime – currently it is viewed through too small a lens. The aperture needs to be bigger and cooperation needs to evolve. Privacy concerns and other regulatory frameworks make it almost impossible for law enforcement organisations to share information – a large and ongoing problem.

The second issue is the lack of standardised testing of the security features in 5G-connected devices. Consumers cannot make a proper assessment of the devices they buy. 'Security by design' is an opportunity for regulation to ensure that users get the 'right' security by default. There is a strong trust relationship amongst many participants – operator, regulator, vendor – in the standards community and more use should be made of that.

A representative from a European regulator argued that cybersecurity should be viewed as an issue of behaviours and trust. How do different actors approach the same security risk? Companies may want to look for cost-effective solutions, as they have financial pressures to consider as well as security. Consistent approaches are important.

COMPETITION IN DIGITAL MARKETS

This panel was opened with an overview of the EU's Digital Market Act by a speaker from an economic consultancy firm. The DMA's twin objectives are to achieve fairness and contestability; its provisions

Left to right: Ian Scott, Chairperson and CEO, Canadian Radio-television and Telecommunications Commission; Björn Blondell, Head of Division, Market Development, Swedish Post and Telecom Authority; Chenda Thong, Chairman, Telecommunications Regulator of Cambodia; Kalana Prince-Wilson, Board Member, Telecommunications Authority of Trinidad and Tobago

apply to any company operating in Europe with a number of users exceeding a given threshold, thus avoiding the need to define markets and market dominance. The objective of contestability rather than competition leaves a few questions unanswered: it is unclear how contestability can be measured and whether this new kind of regulation has an impact on innovation, since it targets companies that have become powerful as a result of innovation in markets characterised by strong network effects. The UK, not subject to the DMA, proposes instead that a specific code of conduct is drafted for each company deemed to have Strategic Market Status.

> **“It is unclear how contestability can be measured.”**

A Latin American regulator highlighted how, as major markets provide new regulation, other countries tend to align themselves to the new rules – as with GDPR, for example – arguing that it makes sense to' wait and see' where the international ripple effect takes the region. A panellist from a European mobile network operator remarked that the DMA imposes an obligation to provide third party access to bottlenecks and provide interoperability, which will benefit operators willing to venture into new digital markets.

A representative from a platform explained the unique selling point that enabled it to overcome the huge barriers to entry in the digital platform space. They recommend that quantitative trigger levels like those in the DMA should be followed by qualitative analysis, to avoid false positives and wasting regulators' time. It is also important to make sure that any obligation imposed on a platform does not harm some other principles, like privacy.

PRIVACY AND DATA PROTECTION

A panellist working in digital media literacy explained that young people have developed social norms and workarounds for their privacy, generally by using multiple accounts and platforms. However, they expect the platforms that they use to respect context cues in the same way their peers do – for example they assume that platforms where messaging disappears cannot hold their messages on their servers – and this is not always the case. In addition, young people's understanding of their legal privacy rights is poor.

A representative from a specialist law firm explained the current complexity involved in cross border transfers of personal information, especially where there is more than one border involved. Some transfers require a case-by-case contractual approach, while the GDPR is dealt with through a jurisdiction-by-jurisdiction approach. Even though many privacy laws have common underlying principles, they are different in detail and often in concept.

AI REGULATION

Privacy laws that have provisions for automated decision-making already regulate some aspects of artificial intelligence, but specific regulation for AI is only emerging now. Legislation is underway in the EU, the UK, Canada and Brazil, for example. The AI Act in the European Union proposes a progression of AI-related risk from 'unacceptable risk' systems, which cannot be deployed, to 'higher risk' systems, which have significant requirements attached to them. One panellist questioned whether these developments are necessary, or whether existing laws already address the issues, arguing that if sector-specific provisions are needed then there needs to be certainty about how these new technologies work and are applied to the industry under analysis.

Another panellist provided the example of an AI-powered toy equipped with camera and microphone. The toy can repeat what a child says and predict the child's answer, as well as collecting the information. How do we ensure that this toy is not hacked and manipulated, he asked, and who is responsible?

When the discussion came to the use of AI and publicly available data by law enforcement, a panellist observed that public institutions might choose to build their own AI because they cannot know what the algorithms behind third party AI are actually doing. Algorithms that are built with proxy data are especially problematic, so regulation needs to address bias and demand transparency about how the algorithms are built.

CLIMATE CHANGE AND SUSTAINABILITY

Collaboration within and across industries can improve sustainability. For example, operators across the EU moved towards universal charging equipment to reduce e-waste. The Commission acted in the field of product replacement, which has been especially fast in this industry, drawing up provisions for mobile phones. The European body of regulators, BEREC, acknowledged the problem of monitoring green goals with the current mix of inconsistent metrics and has published a report on sustainability which includes a proposed set of indicators.

Many speakers on the panel felt that the downstream impacts of telecommunications services should also be considered when monitoring sustainability. 5G is expected to improve productivity in many industries and provide new, virtual services that will reduce the need for physical movement and the environmental footprint of networks.

THEMES AT THE OTTAWA IRF

The International Regulators Forum brought together regulators from around the world to consider progress in broadband and the digital divide, platform and content regulation and the harmonisation of media frameworks.

- On connectivity, it was noted that many societies were progressing rapidly with digitisation in their economy and public services. A core of the population, around 10 per cent, are extremely hard to persuade and risk being excluded from many services. This may be due to a distrust in doing business online, especially in 'cash societies', and includes people for whom broadband is largely affordable. It was acknowledged that a mix of technologies were needed and that satellites, especially low earth orbiting satellites, would have a key role to play in many hard-to-reach areas now that latency issues had been significantly improved.
- 5G spectrum is being expanded around the world as disputes involving incumbents are gradually being resolved. Passive infrastructure has been successfully used for siting hardware in many countries, even if there remains suspicion among some of the population, and occasional acts of vandalism.
- The aim of platform regulation is to 'enable the benefits whilst managing the risk'. There was agreement on the need for promoting better competition, with two examples cited: portability and interoperability. Telecoms networks, by comparison, are fully interoperable while number portability had been essential to opening that market to competition. It was also pointed out that online platforms are not used to regulation, and regulators need to build relationships with them. A number of countries are turning to the idea of a digital regulatory body.
- The debate on media frameworks recognised that many companies find their content regulated differently in different media. However, the divergent levels of consumer engagement and creation make equity complicated. The objectives of regulatory media frameworks remain constant, and these should drive any new regulation rather than harmonisation for its own sake, was one view. Attempts at harmonisation had to take account of different regulatory cultures. But traditional media needs to survive, and to do so must be able to operate within the same legal environment as platforms.

A TOOLKIT FOR SPECTRUM AUCTIONS

Auctions are used worldwide to award valuable spectrum licences, but have a mixed record. **GEOFFREY MYERS** offers a toolkit of analytical frameworks designed to help increase the chances of success

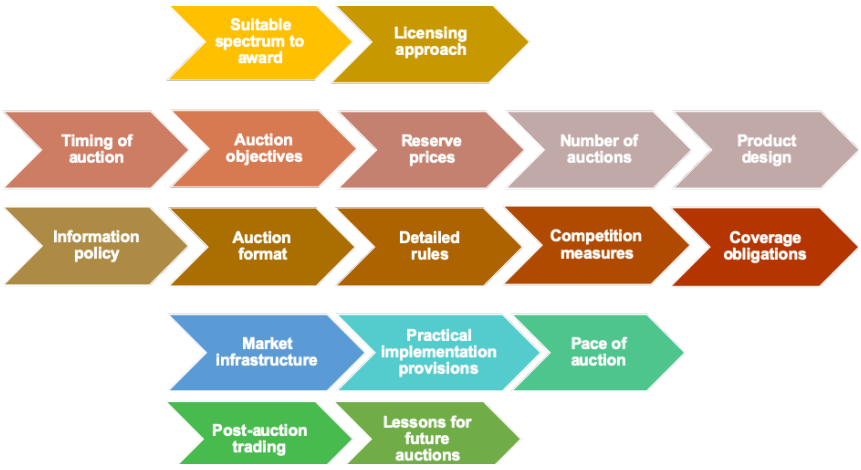
Using auctions to award spectrum licences is mainstream practice worldwide. Not all spectrum licences are suitable to be auctioned; as well as licence exemptions in cases like Wi-Fi, arrangements for spectrum sharing are growing in importance. However, the mainstream frequency bands for cellular mobile services are allocated in auctions in a large number of developing and developed countries. The regulators designing and running auctions can face very different market conditions and economic and political contexts. They may have limited experience and expertise and face significant decision-making challenges. Beneath the surface of overall accomplishment, auctions remain risky. Outcomes are hard to predict, and auctions can work out broadly as expected, be highly successful, or go embarrassingly wrong.

Sometimes the circumstances can be unfavourable and outside the control of regulators, such as poor macroeconomic conditions or inherently weak competition in the auction. But there are also avoidable failures. A common mistake is the setting of reserve prices at too high a level, leading to valuable spectrum being left unsold and not brought into productive use for either the public or the economy. Suitable analytical frameworks can help regulators make better, more consistent decisions and improve the chances of the auction achieving successful outcomes. A toolkit of analytical frameworks is developed in my new open-access book, *Spectrum Auctions: Designing markets to benefit the public, industry and the economy.*

CATEGORISING DECISION-MAKING

Regulators face multiple decisions in designing an effective end-to-end spectrum auction process. These are summarised in the 17 categories illustrated in Figure 1, which cover prior steps before the auction (first row), designing the auction itself (second and third rows), running the auction (fourth row), and post-auction events (final row). Within each decision step there are large and small choices to fit the design decisions to the situation prevailing in a given country, the characteristics of the spectrum on offer, market conditions in the industry, and key public and political values. This repertoire of choices can cope with some of the complex recurring problems of oligopolistic markets and strategic behaviour by large, well-resourced companies – problems that are likely to be permanently present for regulators in most mobile markets.

FIGURE 1: RANGE OF DECISIONS FOR A SPECTRUM AUCTION



Source: Myers, Spectrum Auctions: Designing markets to benefit the public, industry and the economy (2023)

Tailored analytical frameworks can assist policymakers in taking balanced decisions on the many required issues to cope with these exceptionally difficult conditions. The frameworks help to organise the relevant considerations, to structure the analysis such as identifying the most important trade-offs, and to guide decision-makers to take account of differences in circumstances within a consistent overall approach. The toolkit includes frameworks falling into a range of types as shown in Figure 2, along with specific examples.

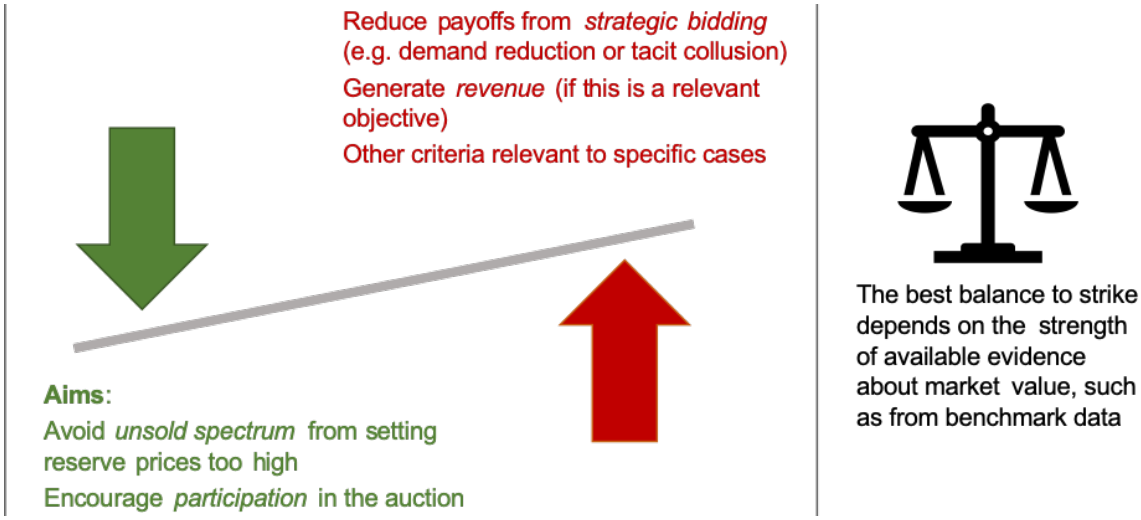
FIGURE 2: TYPES OF ANALYTICAL FRAMEWORK

TYPE	EXAMPLE
Checklist	List of undesirable spectrum management practices to be avoided, such as leaving valuable spectrum fallow which can arise from the regulator withholding it or failing to sell it in an auction.
Categories and their distinct characteristics	Range of spectrum licensing models and their varying implications for the resulting spectrum markets, including oligopoly with exclusive licensing, free-for-all competition with licence exemption (like Wi-Fi), or in-between models with spectrum sharing approaches.
Contrasting different analytical perspectives	Different models of decision-making – 'rational-comprehensive' versus incrementalism from the status quo in 'muddling through'.
Diagnosis	Features which generally characterise successful markets and sources of market failure.
Pros and cons	Advantages and disadvantages of direct procurement to further the important policy goal of extending and improving rural coverage, compared to coverage obligations included in auctions.
Trade-offs to balance considerations	When setting reserve prices, some considerations favour lower reserve prices (e.g. price discovery) and others support higher prices (e.g. revenue-raising) – the trade-off needs to be judged in light of the degree of uncertainty in the available pre-auction evidence on market value.
Structuring the analysis	Multi-faceted issues, such as the competition assessment to decide whether and which measures to impose in the auction (e.g. spectrum caps or set-aside for new entrants) to promote downstream mobile competition using three steps: step 1 identifies the spectrum allocations in the auction which could lead to weakened retail competition; step 2 assesses the risk that the worrying spectrum allocations identified in step 1 occur in the auction; and step 3 judges the effective and proportionate competition measures to impose, paying attention to regulatory failure risks.

Source: Myers, Spectrum Auctions: Designing markets to benefit the public, industry and the economy (2023)

To explore an example from Figure 2 in more detail, the framework for reserve prices can assist in avoiding the mistake of setting them too high. Regulatory judgement is required, because there is a trade-off to be made, as Figure 3 shows. On the one hand, some considerations point towards lower reserve prices in order to avoid unsold spectrum, encourage participation, and promote price discovery (i.e. the operators' understanding of the spectrum's market value). On the other hand, where there is a risk that the auction may not be competitive (which is an occupational hazard in spectrum auctions due to the usually small number of bidders), higher reserve prices can mitigate the incentives for operators to engage in some types of strategic bidding by reducing the payoff, such as making tacit collusion less profitable. In such circumstances, a price floor can affect the bidding and outcome with positive gains both for economic efficiency and revenue. Higher reserve prices can also help on other criteria in specific cases, e.g. to avoid contributing to an excessively slow auction (as for the marathon, nine-month auction in Portugal in 2021).

FIGURE 3: FRAMEWORK OF TRADE-OFFS WHEN SETTING RESERVE PRICES



Source: Myers, Spectrum Auctions: Designing markets to benefit the public, industry and the economy (2023)

SETTING RESERVE PRICES

From an economic efficiency perspective, it is desirable for the regulator to be confident that reserve prices are low enough to be below market value, allowing the auction to do its job of setting prices. The weights to accord to different considerations, when choosing from among the wide range of candidate reserve prices, will depend on the circumstances such as the risks that are most likely or worrisome, and on the objectives of the auction. The strength of the available evidence, such as from international benchmarks, will also affect how to strike the best balance.

Reserve prices can therefore be set more or less conservatively depending on an informed judgement about the specific balance of risks, and a careful interpretation of the available evidence on market value. Greater uncertainty increases the risks from setting higher reserve prices which are intended to increase revenue or deter strategic bidding if competition in the auction is weak, because the regulator may inadvertently overprice the spectrum – an outcome observed all too frequently around the world. Uncertainty therefore favours setting lower reserve prices. These can encourage firms to participate, improve price discovery and mitigate the risks of consumers failing to benefit from scarce spectrum because it is left unsold.

> **“Greater uncertainty increases the risks from setting higher reserve prices.”**

DIFFERENT APPROACHES BY BAND

For instance, to set the reserve prices for the UK's auction in 2021, Ofcom took different approaches between bands, depending on the strength of the available evidence. Benchmarks from earlier European auctions were available on the valuable low-frequency band of paired spectrum at 700 MHz, which was suitable for operators to provide wide-area 5G coverage. These benchmarks provided useful comparators despite forming a wide range between just below £100 million per 2x5 MHz block (Germany) and more than £500 million (Sweden) when expressed on a UK-equivalent basis (such as adjusted for differences in population and currency). Ofcom decided to set the reserve price at £100 million to be confident that it would be below market value and so leave room for price discovery. In the auction the price was bid up to £140 million, or £840 million for the entire band of six blocks, paid by the winning mobile operators EE, O2, and Three (while Vodafone dropped out of the band to resolve the bidding).

By contrast, little reliable information about market value was available for another, less valuable band, 700 MHz supplementary downlink (SDL), which was expected to be used to provide additional 5G downlink capacity. Ofcom responded to the uncertainty by setting very low reserve prices at just £1 million per 5 MHz. This decision was vindicated, because it allowed the spectrum to sell even though it only attracted a single bid at this price from EE (with apparently no other mobile operator having a value above even this low price).

The varying reserve prices selected by Ofcom for the 2021 auction emphasises an important lesson about the toolkit – that applying an analytical framework is not a mechanical process. Decision-makers will always need to use their judgement. However, the framework can assist by identifying relevant factors and evidence and guiding the decision-maker about the best way to take account of the applicable conditions.

In addition, the framework types in Figure 2 are not mutually exclusive and can co-exist

in more layered tools, such as to assist in the multi-faceted choice of auction format. There is no perfect auction design – spectrum auctions represent a complex market design problem because of the need to grapple with the challenges arising from a range of issues. These include: trade-offs between multiple objectives such as allocating the spectrum efficiently, promoting downstream competition, extending mobile coverage and, in some countries, raising revenue for the government; spectrum blocks which can be substitutes or complements for participating firms; risks of strategic bidding due to a relatively small number of bidders; and scope for the auction outcome to profoundly affect the terms of downstream competition between mobile operators and the quality of mobile coverage experienced by the public.

> **Spectrum auctions represent a complex market design problem.**

AUCTION FORMATS

The main formats used for spectrum auctions are the simultaneous multiple round ascending auction (SMRA), the 'simple' clock auction, the combinatorial clock auction (CCA), or a single round of sealed bids. A helpful analytical framework to guide the choice of auction format includes:

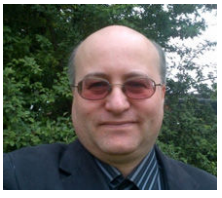
- A checklist of the many types of bidding risks to assist the regulator to avoid missing relevant considerations in its analysis. Examples of the risks which can be faced by auction participants and affect the outcome include managing budget constraints, exposure to aggregation risk where spectrum blocks in the auction are complements yielding synergy value, navigating complicated bidding mechanics, price driving, and tacit collusion.
- Pros and cons of the different formats for each of the bidding risks so that the regulator can base its decision on an informed understanding of how bidders might respond to each format. Because there is no perfect auction design, each format has different strengths and weaknesses.
- Structuring the analysis of the trade-offs which need to be judged through considering the pros and cons of the format in terms of the bidding risks alongside their likelihood of occurring in the particular circumstances of the auction, and the implications for achieving the auction's specified objectives. The conclusions may vary depending on, for example, the relative weights assigned to each of allocative efficiency and revenue raising.

Some regulators stick with a 'tried and trusted' auction design (such as BNetzA in Germany), but others place greater weight on the considerations in this framework and adopt an approach of 'horses for courses' by varying the format to suit differing circumstances. For example, for the 13 spectrum auctions in the UK between 2000 and 2021, Ofcom chose the SMRA format for seven, the CCA design for three, and sealed bid auctions for the other three.

In seeking to derive lessons about best practice, it is important to avoid making the perfect the enemy of the good – substantial benefits can accrue simply by avoiding undesirable spectrum management practices. A useful checklist includes the following:

- Spectrum that is scarce should be put to productive use. Even short of optimum, a second-best use is still far preferable to spectrum being left fallow, which can arise from the regulator withholding it or failing to sell it in an auction.
- Measures to promote downstream competition between mobile operators are important. But their formulation should also reflect the risks of regulatory failure, such as overly restrictive spectrum caps that substantially narrow down allocation possibilities and unduly limit rivalry in the auction itself.
- Onerous coverage obligations on all licences in auctions are not the only way to achieve improved mobile coverage. Direct procurement or a more targeted approach can sometimes achieve more in practice for people on the ground.
- While there are sophisticated analytical questions in auction design, the highest priority is to get the basics right, such as avoiding reserve prices that are set excessively high.
- Applying sufficient expertise can avoid many design blunders. Key requirements are working to nurture trust, providing bidders with information and flexibility to make their decisions, and maintaining an appropriate pace to the auction by avoiding excessively small price increments.

In a world of imperfect choices and asymmetric information, regulatory decision-making can be challenging. Regulators often lack key information and have difficult trade-offs to judge within processes that can be slow, subject to human biases and at risk of capture by interest groups. A toolkit of tailored analytical frameworks can assist regulators to navigate these challenges. And a more consistent basis for decisions can enhance the predictability of the environment for businesses to invest and flourish, benefitting the public, industry and the economy.



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SEEKING BETTER WAYS TO MANAGE SPECTRUM

CHRIS WOOLFORD rounds up expert views on how future demands for spectrum can be met and international processes for spectrum management improved

Ensuring the optimal use of public airwaves is increasingly challenging. The 'low-hanging fruit' of licensed spectrum has already been plucked. Spectrum policies, especially auctions, have been pursued in many countries and, over recent decades, hundreds of billions of dollars have been spent around the world to acquire rights to access highly sought-after spectrum bands. There is little or no 'greenfield' space left in key parts of the spectrum.

Meanwhile demand for spectrum continues unabated, not least to deliver an increasing number of connections at the quality demanded by consumers. Efficiency is improving, with more data being squeezed through fewer megahertz, but supply is limited. In making spectrum available, regulators are forced to take decisions that meet the needs of an increasingly diverse and expanding range of spectrum users, many of whom will be left unsatisfied.

Against this backdrop the IIC held two spectrum roundtables in 2022 to consider how spectrum needs can be expected to evolve over the coming years and what this may mean for spectrum regulation. Both roundtables were expertly chaired by Ajit Pai (American Enterprise Institute and former chairman of the FCC) and attended by 25-30 senior spectrum experts selected from industry, consultancies, academia and national regulators. The first discussion considered the topic of spectrum broadly, while the second focused on two particular aspects of spectrum regulation: spectrum sharing and the evolution of international spectrum frameworks. Both were held under the Chatham House Rule.

'COMPLEX AND MESSY' SOLUTIONS

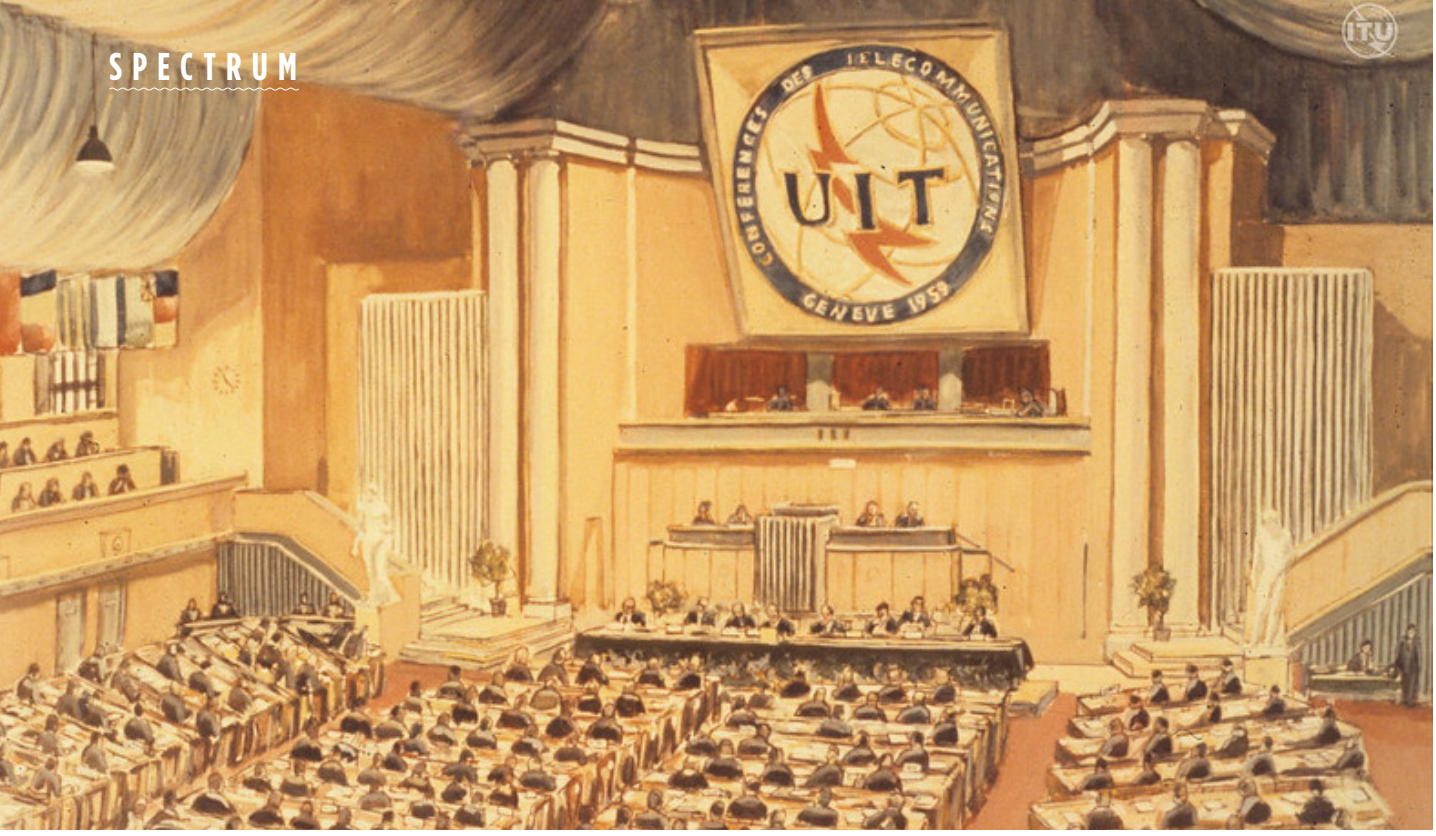
The first meeting was held while much of the world was in lockdown. It was therefore unsurprising that some commentators began by referencing how COVID -19 has shown the power of Wi-Fi in providing multiple connections per household. Some further noted that much future demand can be expected to come from indoor use, including from applications using augmented or virtual reality. This could imply use of more licence-exempt spectrum, or spectrum which is suitable to support 'self-deployment' in shared bands. Others noted that mobile operators will continue to play an essential role and will need access to spectrum for a range of essential services as well as greater capacity.

There was a general feeling that future approaches to spectrum distribution will be more complex and, in some respects, 'messier'. Some participants noted that regulators have been good at packaging spectrum into lots (for example for auction), or alternatively designating specific spectrum bands for unlicensed or licence-exempt use. But such clearcut solutions may not always be suitable in the future. Regulators will need to explore authorisation models that sit between licensed and licence-exempt approaches. This includes light licensing regimes and local licences, with models developed to meet the needs of different geographic areas.

DIFFERENT METRICS FOR CONNECTIVITY

It was proposed by some participants that the way coverage is thought about will need to change. Future connectivity should be about devices rather than people, and the onus should be on providing connectivity to such devices, including in locations where people may not necessarily live. Different metrics to describe connectivity and coverage will be important: less about population and more about territorial or industrial coverage. Some regulators are already starting to think along these lines.

There are very different positions faced by countries around the globe. In the developing world especially it is likely that many areas, including those in which people live, will be considered uneconomic. In many countries 3G devices are still the most widely used and charging devices is not always straightforward. In these environments users are unlikely to be willing to pay more for higher speeds and network operators will have to consider how best to monetise their investments. Such decisions may become more



difficult if the operators have paid large sums for their spectrum access.

SPECTRUM SHARING

At both roundtables there was a consensus that spectrum sharing needs to become commonplace. In reality, however, it can be hard to persuade users to share spectrum, and even harder to do so internationally. One view was that regulatory frameworks at both national and international level have been developed to solve the problems of the past (for example focusing on individual licences). If spectrum sharing is to be the solution of the future, then frameworks will need to reflect the different ways that users will want access to spectrum. Regulators in turn will need to be less cautious, more adaptable and sympathetic to new ideas.

The roundtable discussed different approaches to spectrum sharing, ranging from the simple to the more complex, such as through databases. Some felt that the initial focus should be on simple models while others were clear that alternative approaches shouldn't be excluded just because they seemed more complex. Sharing solutions would need to be developed on a case-by-case basis and there is no single solution ('horses for courses').

This raises some questions. Many argued that international spectrum harmonisation will continue to be essential and asked how this would fit with divergent national and local solutions. It was also noted that, while local solutions may enable new users of spectrum, this may not always represent the best use of the resource. Others pointed out that there were widely different views on spectrum sharing around the world, with some countries aggressively pursuing opportunities, while others are yet to pursue any significant sharing initiatives at all. Such international divergence may cause complications, not least for the development of international spectrum frameworks.

COOPERATION AND COLLABORATION

What should international cooperation look like? Harmonised technical conditions would, it was felt, continue to be important to enabling economies of scale. But less formal cooperation could also be appropriate, for example in sharing best practice. It is possible that those countries with more experience of spectrum sharing may be able to offer advice and encouragement to those that are just embarking on the journey. Ways must be sought to better facilitate international knowledge sharing. Domestically also there are opportunities for stakeholders to work together on the efficient use of spectrum, including sharing and re-purposing. Participation could come from industry, academia and the public sector.

MANAGING INTERFERENCE

One panellist noted that there is a need for a mindset change: rather than thinking about obstacles to sharing, the focus must be on how it can be made to work. One aspect discussed in the roundtable concerned approaches to managing interference, including what defines an acceptable level of 'permissible interference'. Some participants suggested that concerns over interference were sometimes used as an excuse to block other users from accessing spectrum. At times, spectrally inefficient or outdated technologies (including receivers) are rewarded with protection that results in the inefficient use of spectrum. Those responsible for spectrum management need to get much better at managing interference risks by being more realistic about the assumptions that underpin co-existence models, and making assessments based on appropriate technologies. There should be no tolerance for co-existence models built on 'worst-case upon worst-case' scenarios. Such discussions are commonplace in international groups and resulting decisions can lead to spectrum being left unused.

A fresh mindset can also extend to thinking about users in adjacent bands (and awareness of how such use may

evolve over time) as well as about uses and users in the band itself. It requires spectrum users to be more open and transparent with one another, including about the interference environment. They must be willing to invest in new technologies, not least in respect of receivers. Some suggested that industry stakeholders should be incentivised to work together – perhaps working with academia – to develop new interference models that could then be put to regulators.

THE INTERNATIONAL FRAMEWORK

A final area that provoked considerable discussion was around the international frameworks that govern spectrum use. Some suggested that current frameworks – including the process of holding World Radiocommunication Conferences every four years – were too inflexible and no longer fit for the rapid changes of today's world. But others pointed out that if the ITU didn't exist it would probably have to be invented. If it was, it might not look much different from what exists today.

It was noted that there are some aspects of spectrum use where international coordination is essential. Satellites are an obvious example but aeronautical and maritime services also clearly benefit from international coordination. In some areas, such as UHF broadcast bands or the protection of passive bands, an internationally agreed approach is all but essential.

However this does not mean that all spectrum use needs to be rigidly managed at international level. National regulators are increasingly exploring the use of higher frequency bands, often for indoor use, where the propagation characteristics mean that cross-border coordination is unlikely to be necessary. Advances in technology mean that it is possible to put multiple bands into chipsets. This implies that international harmonisation for such devices is becoming less critical and it provides the opportunity to reconsider service allocations for some bands in the ITU Radio Regulations and to revisit other regulatory instruments, such as IMT identification.

Just as countries are at different stages of development, they have different requirements from the ITU. In more developed jurisdictions, with well-resourced spectrum regulators, flexibility at the international level is often a means of developing approaches that align with national needs. However, in countries with fewer resources and less expertise, developing national solutions can create uncertainty. More prescriptive solutions may be preferred even if they are imperfect.

At the same time, it was recognised that the flexibility that currently exists in the ITU Radio Regulations could be better utilised. While it should not determine technology choices, a key role of the ITU is to determine how services should be respected at national borders. Countries should be encouraged to take advantage of this flexibility. In parallel it was recognised that initiatives to promote capacity building are required. Organisations such as ITU-D or the IIC could play an important role in this area.

A BETTER AGENDA

Although there was some scepticism over whether holding World Radiocommunication Conferences every four years was sufficient, it was accepted that this would not change – the four-year cycle of WRCs is 'ingrained'. But for some, there is a benefit to having a defined end point to negotiations. While there is little desire to try to revolutionise the process, there was a feeling that particular elements could be improved – the ITU should be more strategic and focus its attention on the areas where it can add most value. For example, detailed discussion of IMT identifications have taken up vast amounts of time at recent WRCs and are expected do so again at WRC-23. But IMT identification is increasingly driven by the standards bodies and some mobile bands, such as 3.6-3.8 GHz in Europe, a core band for 5G, are not even recognised by the ITU. Satellites are another area that might benefit from a more strategic discussion as new constellations, which weren't foreseen even just a few years ago, are putting significant new pressure on the regulatory frameworks.

The WRC agenda setting process came in for considerable criticism. It was usually discussed last and squeezed into the final hours and minutes of a WRC, often in the early hours of the morning. This, it was felt, isn't appropriate for a discussion that will determine the direction of a significant part of the ITU's work over the next four years. The approach should be a strategic one, reflecting anticipated technology and market trends and what this may mean for future spectrum regulation. It should also only address issues which require essential changes to the Radio Regulations. Ideas proposed included taking the work on the agenda setting process outside of the WRC and putting a quota on the number of agenda items regions could propose, forcing them to focus their priorities.

CONTINUING THE DEBATE

These two round tables are intended as the start of a discussion. They were not expected to produce answers and this article simply picks up on some of the key themes and ideas that were raised. A point raised by some participants concerned the difficulty of holding discussions within the confines of the traditional regulatory mechanisms, such as the ITU. There are considerable vested interests to negotiate and a resultant focus on immediate challenges and issues, sometimes at the expense of longer term strategic priorities. It was suggested that other organisations, including the IIC, consider the issues raised in this article. My colleagues at the IIC will be happy to facilitate further discussion on this topic.

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IMPLEMENTING THE DMA

As the Digital Markets Act enters the implementation phase, **GEORGE HOUPIS** and **TOM OVINGTON** highlight the role of proportionality

The Digital Markets Act (DMA) sets out a series of do's and don'ts, which firms will have to comply with for any 'core platform service' (CPS) where they are designated as a gatekeeper. The DMA aims to improve the contestability and fairness associated with the various CPS's, as well as for adjacent/downstream services. This ambitious and wide-reaching form of ex-ante regulation is intended to complement the existing ex-post competition regime.

Gatekeepers are characterised as large platforms that serve as an important gateway for business users to reach end users and that enjoy an entrenched and durable position in their operations. In the majority of cases, gatekeepers will be defined based on a number of quantitative thresholds, measured in terms of revenues, market capitalisation and user base.

Core platform service describes the digital platform activities where the European Commission (EC) is particularly concerned about the nature of competition given the significant role of (potential) gatekeepers in these activities. Such services include 'online intermediation services', 'online social networking services', 'operating systems' and 'online search engines'.

By 3 July 2023 at the latest, potential gatekeepers will have to notify their CPS to the commission if they meet the thresholds established in the DMA. The commission will then have 45 days to adopt the designation decision, following which gatekeepers will have six months to comply with the obligations in the Act, by 6 March 2024 at the latest.

In total, the DMA includes 10 different core platform services and 22 obligations that gatekeepers will have to adhere to (depending on their CPS). There is still significant room for interpretation about how the various obligations should be implemented, but it's recognised that there won't be a single solution for complying with each obligation, since:

- Obligations and the way they will need to be implemented have not been defined in detail in the DMA, with typically only a few paragraphs on each. (In contrast, in the telecoms sector there is more guidance (in the form of EC regulations/recommendations, or remedy specific consultations by regulators) on how each remedy should be applied, supported in a number of cases by an impact or 'cost benefit' analysis.)
- A number of the obligations apply to all designated gatekeepers, irrespective of their business model and the service in question.
- The objectives of contestability and fairness are not specified in detail in the DMA, although there are some high-level indications of how they should be interpreted. There is also limited precedent for the 'contestability' objective (compared to the 'effective competition' objective under the telecoms regulation regime)
- Third parties, depending on their position, may not agree on how each obligation should be implemented.
- The precedents from ex-post competition cases such as Google Android illustrate the challenges in designing and implementing appropriate obligations.[1]
- There may be some trade-offs between trying to promote intra-platform and inter-platform competition
- Other legal/technical considerations will need to be taken into account, such as data protection laws and the security of services, when deciding how best to implement the various obligations.

In the telecoms sector, regulators typically stipulate how firms have to comply with different obligations. In contrast, the onus will be on gatekeepers to decide how they are going to comply with the relevant obligations in the DMA. However, the EC may still need to assess whether the gatekeepers have complied as:

- Gatekeepers can ask the EC for guidance on whether their proposed solutions for implementing the obligations comply with the DMA.[2]
- The EC can decide to open its own

investigation into whether gatekeepers have implemented the obligations in a way that complies with the DMA.[3]

Gatekeepers will also be required to submit compliance reports to the EC on an annual basis, including a version that can be made publicly available. These compliance reports are likely to be subject to significant scrutiny by both the EC and third parties. Therefore it seems inevitable that the EC will end up investigating whether obligations have been implemented appropriately.

THE ROLE OF PROPORTIONALITY

In addition to being effective, the DMA makes it clear that the obligations should be implemented in a way that is proportionate.[4]

The EC conducted an impact assessment of the draft DMA in December 2020, which considered the merits of different ways of designing the Act. However, the impact assessment did not go into detail about the ways in which the various obligations could be implemented. (Some of the obligations weren't even included in the draft of the Act). Ensuring that the obligations are implemented proportionately where there are different options will almost definitely require additional analysis. The DMA indicates that proportionality is relevant for the obligations in Articles 6 and 7 – though debate around how the Article 5 obligations should be implemented should not be excluded, as these obligations are set out also at a reasonably high level.[5]

Whilst the DMA does not itself include a definition of proportionality, it is defined under EU law more generally:[6]

- Measures must be suitable to achieve the desired end i.e. the way in which the obligations are implemented must actually achieve the DMA's objectives and avoid undermining them.
- Measures must be necessary to achieve the desired end i.e. the way in which the obligations are implemented must be the least intrusive way of achieving the DMA's objectives.
- Measures must not impose a burden on the *individual* (our emphasis) that is excessive in relation to the objective sought to be achieved. This burden could relate to a wide range of actors, including the EU, national governments, regional or local authorities, economic operators and/or citizens.[7]

It is possible that some ways of implementing specific obligations could impose significant implementation costs not only on the gatekeepers, but also on challenger firms and/or business users.

THE DMA'S OBJECTIVES

The assessment of whether obligations are implemented in line with the proportionality principles is related to the DMA's objectives. While 'contestability' and 'fairness' are repeatedly referred to, they can be thought of as intermediary objectives (a means to an end). The text makes it clear that the ultimate objectives of the Act are to promote:

- Innovation
- High quality of digital products and services
- Fair and competitive prices
- Choice for end users.[8]

The DMA highlights that these objectives should be achieved for the digital sector as a whole.[9] This would be consistent with all providers of core platform and adjacent services being in a position to maintain or improve the quality of services that they offer, develop new services and expand through successful innovations, thereby expanding choice for end users and driving down prices.

This means that, depending on the nature of the CPS, gatekeeper and obligation in question, a balance may need to be struck by ensuring that all players have sufficient incentives to innovate in order to achieve the DMA's objectives. This should be seen as the 'equivalent' in the implementation of the DMA of the application of the well-established best practice principle in telecoms regulation of undertaking impact assessments of different potential remedies/remedy options to address a market failure in order to promote competition, rather than 'an efficiency defence'.

CONTESTABILITY

Due to network effects (when the benefits to users increase as the number of other users rises) and the role of data and scale, rivals to companies that have been able to gain a first mover advantage in some CPS's have faced challenges in competing with them.[10] For this reason contestability in the context of the Act could be achieved when barriers to entry are reduced or removed.

The Act also seeks to ensure that contestability is achieved in downstream services to the CPS. As a result, the achievement of the objective includes the prevention of leveraging between services, including tying and self-preferencing (discriminatory treatment of a gatekeepers' own services).

The DMA also makes it clear that one of the ways to reduce or remove barriers is through providing non-gatekeepers with access to key inputs controlled by gatekeepers.[11] This could have an impact on contestability for both the core platform and downstream services depending on the key inputs in question.

FAIRNESS

Fairness in the Act means addressing imbalances in bargaining power to ensure that non-gatekeepers can adequately capture the benefit from their innovations.[12] There are likely to be two aspects to fairness:

Pricing: The jointly generated profits need to be split in such a way that the resulting division of economic surplus between gatekeepers and business users provides appropriate incentives to both.

Unfair practices and conditions: Gatekeepers should not impose 'unfair' terms and conditions on business users,[13] for example restrictions on multi-homing by imposing most-favoured nation clauses.[14]

Achieving the first aspect is likely to be complex. The general principle should be that the division of the economic surplus should be commensurate to the risk taken and economic value added by different parties. It is possible that experience from transfer pricing may be helpful in this regard to set out the framework. But estimating the returns required in a 'competitive' market is challenging in practice because of the limitations in available benchmarks. The second aspect may be easier to address, especially where the terms and conditions clearly reduce the ability of business users to extract economic surplus. However, there are also likely to be instances where terms and conditions have a reasonable commercial rationale, in which case a balance may need to be struck.

> **The general principle should be that the division of the economic surplus should be commensurate to the risk taken and economic value added by different parties.**

ASSESSING PROPORTIONALITY

Deciding whether an obligation has been implemented proportionately means considering whether:

- It supports the achievement of contestability and fairness, given the objective to ensure quality, choice and innovation in the provision of CPS.
- There is a less intrusive way of achieving the objectives.
- The burden on gatekeepers, non-gatekeepers, consumers or any other stakeholder is excessive.

Drawing on the guidelines for better policy-making and regulatory impact assessments by the EC,[15] Ofcom[16] and ComReg,[17] we set out some steps to take when trying to find the most proportionate way of implementing an obligation:

- Identifying a range of different implementation options (unless it is not relevant to the CPS in question)
- Identifying the likely impact of the different implementation options on relevant stakeholders, including gatekeepers, challenger firms, business users and consumers
- Developing criteria that the options can be assessed against, linked to the ultimate objectives of the DMA
- Quantifying the costs and benefits of different options where appropriate and feasible (i.e. where data requirements allow)
- Considering the extent to which different implementation options are future-proof.

Whilst gatekeepers may have an advantage in their understanding of the different options and

their impact on a gatekeeper's business, they also have an 'incentive' disadvantage since their analysis could be perceived as biased.

There is, however, significant precedent of evidence-based regulatory impact assessments from the telecoms sector, which has been used to consider the merits of different obligations such as for mobile number portability.

OVERALL IMPACT OF THE OBLIGATIONS

The DMA includes 22 different obligations. While not all may be relevant to each CPS, it will be important to consider the impact of the obligations as a package when assessing proportionality,[18] taking into account any interactions between the obligations. (Such as obligations to offer access to inputs under 'fair, reasonable and non-discriminatory' conditions with other non-discriminatory obligations.)

THE CONTESTABILITY OF CORE PLATFORM SERVICES

The DMA includes 10 CPS's, which are varied in nature. For example, the market for the provision of cloud services has three major providers, with market share changing over time (see Figure 1).

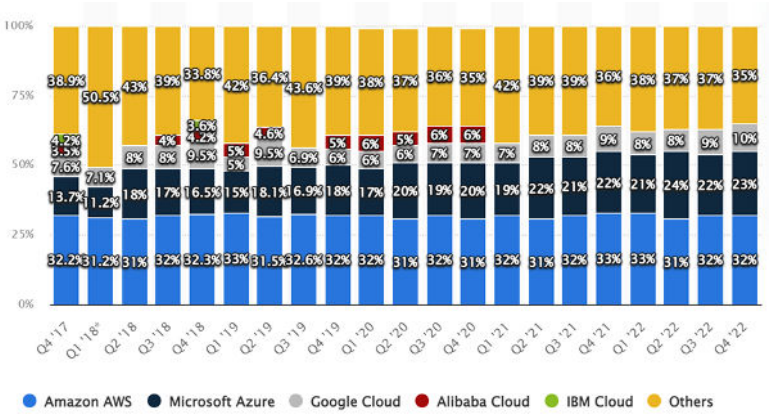
The EC's own impact assessment stated that: 'Amazon, Microsoft and Google have the largest shares of the IaaS and PaaS cloud market in the EU. For these companies, significant investments in physical computing infrastructure (e.g. data centres) are necessary for their core business. Therefore, these companies benefit from high returns to scale, which enables them to sustain their position in the overall cloud market. This business area appears contestable, but could consolidate in the coming years.'[19]

The current level of contestability, and potentially the level of fairness, is likely to vary across different platform services – as well as other features that may affect the assessment of the impact of the DMA obligations (e.g. the degree of multi-homing). The current/forward-looking level of contestability for the CPS and the relative position of a gatekeeper may also need to be taken into account in the assessment of the proportionality of different ways of implementing obligations under the DMA.[20]

CONCLUSIONS

Gatekeepers are currently in the process of deciding how they will comply with the various obligations under the Digital Markets Act. Given that these obligations have not been defined in detail, there is likely to be debate around how a number of the obligations should be implemented in practice. Relying on the use of the principle of proportionality could help gatekeepers, the EC and the other players that compete with or use gatekeepers' platforms to ensure that the obligations are implemented in an effective way. Proportionality is mentioned in the DMA itself and defined more generally under EU law. Proportionality in the implementation of the DMA should be seen as the 'equivalent' of the application of the best practice principle of impact assessments in remedy design in telecoms regulation. Assessing the impact of different implementation options on a range of stakeholders lies at the heart of the concept of proportionality. When evaluating different options for implementing a specific obligation, it will be desirable to ensure that the chosen option achieves the ultimate objectives of the DMA – innovation, high quality of digital products and services, fair and competitive prices, and choice for end users – in the least intrusive way possible. There should also be some scope for taking into account the current/forward-looking level of contestability of the core platform service and assessing the impact of the obligations as a package.

FIGURE 1: RANGE OF DECISIONS FOR A SPECTRUM AUCTION



Source: Statista

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DOMINANCE IN DIGITAL MARKETS

TIM COWEN and **SOPHIA YAKHNO** consider the current status of legislation and enforcement designed to address the power of digital platforms

The 2020s may be the era when politicians work out that almost everything voters buy is transacted through the devices on our desktops, in our pockets and on our wrists. The power and control of the tech platforms is notorious. Their wealth is astonishing, with the top 5 tech businesses worth over a trillion dollars each. (For perspective, the next largest company was for some time Saudi Aramco, though much depends on the price of oil.) The fact that something must be done to address market dominance and its abuse has been established for a while. Legislation has been enacted and actions taken in many countries.

There is also something of a competition among competition authorities taking place. An early showing was made by the Australian regulator, the ACCC, that led the way with its 2019 report[1] but then the CMA in the UK took global leadership with its seminal and weighty 2020 report.[2] Germany's authority has been a leader, with cases taken against Facebook and Amazon, and now Google.[3] Now the US Department of Justice looks to be inching ahead, with its USA vs Google case due in court on 12 September.

The concerns of different governments and competition agencies are similar because they are collaborating. We outline below the issues and cases.

> **"The first issue the authorities faced is that they didn't have people who understand the technology."**

KEY CHALLENGES

Digital markets are complex. The first issue the authorities faced is that they didn't have people who understand the technology. Their systems are of a case-by-case and 'dip in and out' nature, assuming that they can get access to information when needed. Their challenges thus include understanding the features that are different about technology markets, and specifically the role of data.

CREATING MARKET POWER

Certain features of tech markets help to create market power. High capital and intellectual property requirements create high barriers to entry. Google was noted by the EU Commission to have spent $46bn on search by 2017, and was then spending about $1bn per month.[4] Not only are fixed costs very high but incremental costs are very low or almost zero. Anyone else attempting to outpace Google has a huge mountain to climb. Network effects (when the benefits to users increase as the number of other users rises) abound within these markets, making it almost impossible for rivals to reach customers with alternatives. Users do not tend to switch between different platforms.[5] And getting rival products in front of consumers involves using the platform as a distributor – where it has a conflict of interest.

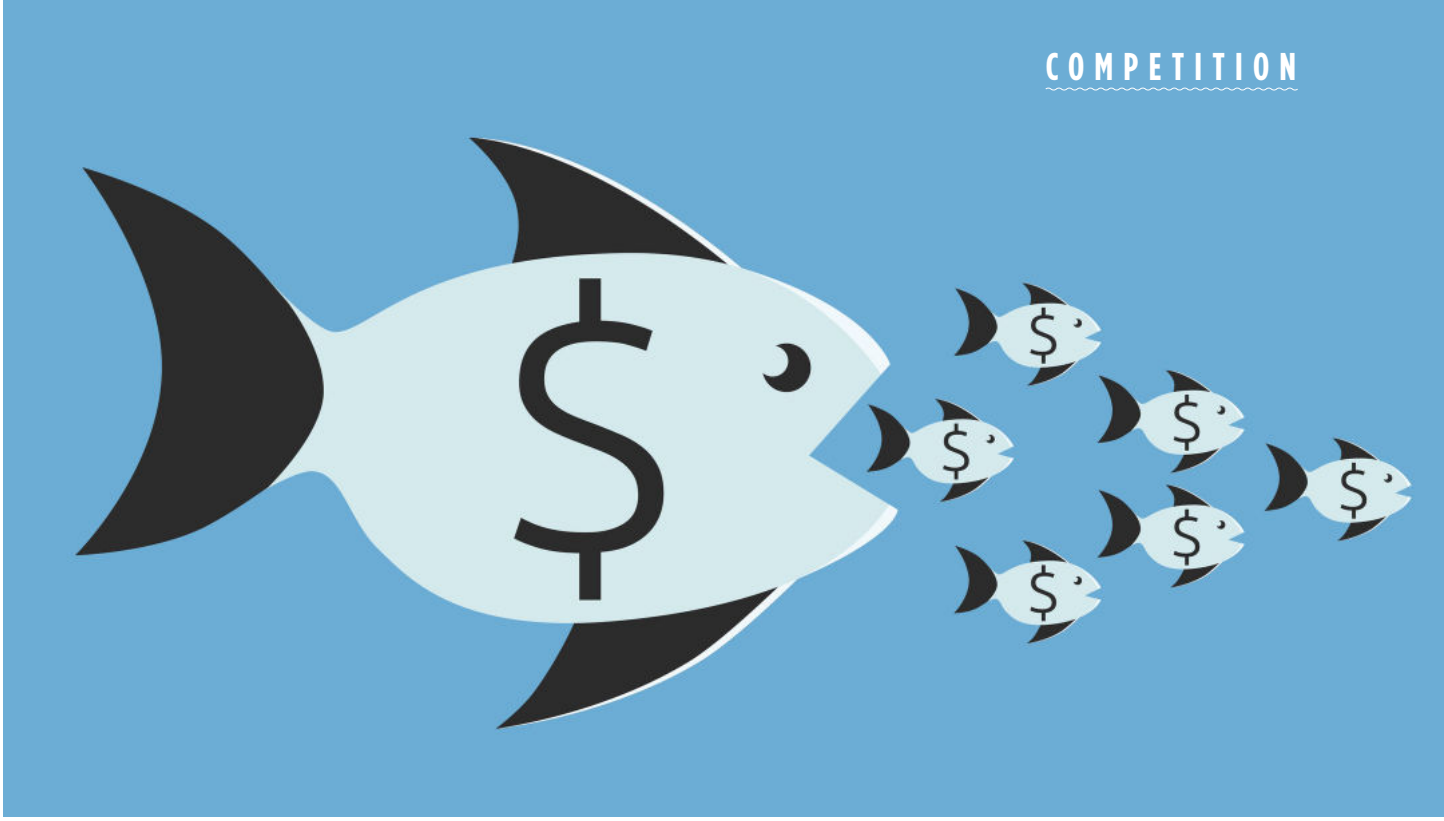
Many digital businesses are 'multi-sided', introducing buyers and sellers. One side (the buyer or end user) is charged a zero or negative price to benefit the seller or advertiser who funds the system.

DATA AS A 'COMMONS'

The authorities have adopted approaches to examine the link between access to data and the possibilities of how such data can be put to productive use. In 2018 and 2019, Germany and France jointly,[6] and the UK[7] reported on algorithms. The US Federal Trade Commission held hearings.[8]

Long seen as the most important business asset, access to data about end user interests is a necessity for competition in digital markets. Platforms can commingle data from multiple sources (touch points). As the latest EU Commission case concerning Amazon's Buy Box found, the ability of a platform to obtain and use non-public market wide data can be a source of market power.

Publicly available web data is different. It is basic to the way that the web operates. It



is emitted by devices connecting to the web. Basic data such as from URLs and web pages, user-agent string data and IP addresses are used by businesses in multiple ways. Many use bots to crawl web pages, informing search rankings; some use public web data such as cookies to understand which distribution channel generated sales. Web data can be thought of as a 'commons' that needs to be protected.

'Privacy washing' – presenting the accumulation of data by a tech platform in the name of privacy protection – has become notorious. For example, Apple has claimed it is a privacy champion. But the French data regulator, CNIL, found that the company's privacy practices were likely to have distorted competition for its own benefit and fined it accordingly.[9]

> **"Web data can be thought of as a 'commons' that needs to be protected."**

TRADITIONAL METHODS FOUND WANTING

Orthodox economics has used price tests to help define markets.[10] With a zero price and bespoke service that a platform provides, the consumer seems to benefit. Clearly, assessing consumer benefit in terms of prices is inadequate. Only when it is appreciated that it is the advertisers who pay can it be understood that it is they who are the real customers. For the platforms, users are sources of data to be monetised.[11]

Product market definition, if starting with consumer offerings, is similarly confusing. If the products (for example, in telecoms, different speeds of broadband) are considered, authorities tend to miss the fact that the platforms' ability to differentiate offerings means that, like telecoms and metal stampers, the supply side defines the market.[12] The EU Commission found this in its recent Amazon Buy Box decision:

'Supply-side substitutability may also be taken into account when defining markets, in those situations in which its effects are equivalent/comparable to those of demand substitution in terms of effectiveness and immediacy. **Supply-side substitution may be particularly relevant for network industries.**'

Many in the antitrust world have missed this point for years. The traditional approach of authorities is to take products offered to consumers as the starting point of their enquiry. To start with what is supplied and analyse that is simply not to be done at the start of the investigation. This thinking may have contributed to the authorities missing what is really going on.

When it is appreciated that supply side factors and the data gathered about the use of products over platforms is central to the assessment of dominance and definition of markets, it can also be appreciated that authorities cannot hope to understand these markets on a case-by-case basis, gathering evidence as they go. They need to become experts.

DIGITAL ADVERTISING

Google has grown to be a world-leading targeted advertising company. It gathers data from users to help target ads from its browser, from products such as Google Search, YouTube and Maps.[13] The CMA's 2020 market study investigated the mechanism.[14] In 2022, acting on a complaint from the Movement for an Open Web, the CMA stopped Google making browser changes that would have blocked

web data availability for competitors.[15] Abuse in advertising markets is now the subject of USA vs Google.[16] Further investigations continue into Apple's App Tracking Transparency where the company blocks access to data for competing advertisers and keeps that data to support its own advertising business.[17] Meta has also come into the firing line. The French competition authority has accepted commitments from Meta for non-search related online advertising.[18]

UNFAIR TERMS

In 2019, Facebook was found to have exploitative business terms.[19] In 2022, the Italian Competition Authority (AGCM) started looking at Google's refusal to interoperate and share data it had gathered. The latest is a new unfair terms case in Germany against Google for not providing users with sufficient choice.[20]

APP STORES

The bundling of billing with apps and restrictive terms that limit apps on app stores generated cases from Epic and Spotify and complaints before the EU and CMA. In the US the NTIA concluded that the mobile app store model is harmful to consumers and developers.[21]

The CMA has concluded that Apple and Google have an effective duopoly on mobile ecosystems and each imposes arbitrary terms on app developers.[22] [23] [24]

Amazon has received numerous fines for abusing its market dominance. In 2021, it was fined $1.2bn for promoting its own logistics service over rivals'.[25] Germany's competition agency (Bundeskartellamt) found its imposition of terms of business were abusive due to lack of transparency.[26] The EU recently decided that it abuses its dominance through its Buy Box.[27]

PAYMENTS

The impact of Big Tech on payments and the financial industry is a recent concern. The UK's Financial Conduct Authority is investigating.[28]

MERGERS

Concerns about the failure of merger control to prevent the accumulation of dominance have been circulating for some years.[29] Some have recently become more active. For example, the CMA ordered Meta to sell Giphy.[30] The US Federal Trade Commission has also amended its complaint against Meta in a lawsuit that seeks the divestiture of Instagram and WhatsApp. The FTC has taken on more cases – Microsoft's Activision Blizzard merger is a further example.[31] EU and CMA investigations continue.[32] [33]

Data aggregation that increases market power is also among deals 'of concern'. The EU required interoperability remedies in Microsoft/LinkedIn[34] and Google/Fitbit[35] to prevent the use of data to restrict entry or enhance market power.

REFORMS

With digital markets dominated by the world's biggest companies there is a consensus that something is wrong. Authorities failed to spot market power accumulation via mergers, or to prevent its misuse. Reports were written.[36] Even President Biden has called for antitrust legislation targeting tech giants in his 2023 State of the Union address.[37]

ARGUMENTS FOR CHANGE

- Current competition law is not fit for purpose, regulators follow pro-monopoly standards
- Consumer choice and innovation should be the new norm, not just consumer welfare
- Competition law needs to stop privileging big business and focus on the benefits of small businesses and market structure
- Regulators should strip the wrongdoer of their profits for their wrongdoing
- Social media is media and should be regulated in the same way as traditional media
- Current merger controls should be changed to meet the challenges of the digital age
- Current inaction on merger controls is unsustainable.

What has been done?

● Germany introduced a new law addressing the digital economy.[38] This also allows the Bundeskartellamt to intervene at an early stage.[39]

● The Digital Markets Act entered into force in autumn 2022.

● The ECN+ Directive was published in May 2021 in France. This new legal framework allows the French competition authority new tools to address Big Tech platforms.[40]

● The UK is set to publish a bill in 2023 to underpin the Digital Markets Unit.

● The House Judiciary Committee in the USA has proposed four bills. Furthermore, a new caucus was formed with the aim of reforming antitrust laws to curb Big Tech power.[41]

● The ACCC in Australia has proposed new regulatory tools for digital platforms.[42]

In terms of reforms in merger control, notification thresholds are linked to jurisdiction and based on the turnover of at least two parties to a transaction. However, in digital markets, often one party has low or no turnover, so platforms acquiring start-ups or smaller business may fall outside the thresholds. The EU has suggested it will look at such transactions and the General Court of the EU has confirmed this approach.[43] The FTC published a study of 616 non-notified acquisitions by six large tech firms[44] and has launched a review of the US merger guidelines.[45] The review aims to focus on features of digital markets, including zero-price dynamics, data and the network externalities.

NEXT STEPS

Authorities are actively looking to strengthen their knowledge of digital markets, developing skills and building teams with backgrounds in areas such as engineering and data science. However they would be wise to remember that monopolists always have more information that they do. Perhaps what is now needed is a greater ability to obtain information and evidence from the platforms themselves about what they are doing and planning. Actions are also aimed at helping enforcers to step in more quickly to prevent harm; but that presupposes knowing what is happening and likely to happen.

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SATELLITES IN AFRICA

JEAN-PHILBERT NSENGIMANA argues that satellite technology is crucial to closing the connectivity gap on the continent

ICT infrastructure is one of the most critical requirements for Africa's socio-economic transformation. Many Africans still lack access to mobile or broadband connectivity and where they do, prices are often unaffordable. Studies undertaken by the International Telecommunication Union found that only 14.3 per cent of households in Africa had internet access by the end of 2019, with those in urban areas four times more likely to have access to the internet than those living in rural areas. The cost of connecting the unconnected by 2030 is estimated to be $100 billion.[1]

While basic connectivity is still a challenge in many places, 'meaningful connectivity' (use of the internet every day using an appropriate device with enough data and a fast connection) is a ubiquitous problem in Africa. In Kenya for example, while close to 50 per cent of the population have basic access to the internet, only 11 per cent have 'meaningful connectivity'. In Rwanda the figures are 22 and 1 per cent respectively.[2] In addition, consumer readiness (knowledge and digital literacy skills) and relevant content (applications and digital content designed for local languages and cultures) continue to hinder the use of the internet. For the 750 million who live in areas without access to broadband connectivity, infrastructure is the primary challenge. This includes a lack of power, (only 38 per cent of Africa's population has access to electricity) poor roadways and bridges, and the absence of terrestrial telecommunications infrastructure.[3]

SATELLITE NETWORK ARCHITECTURE

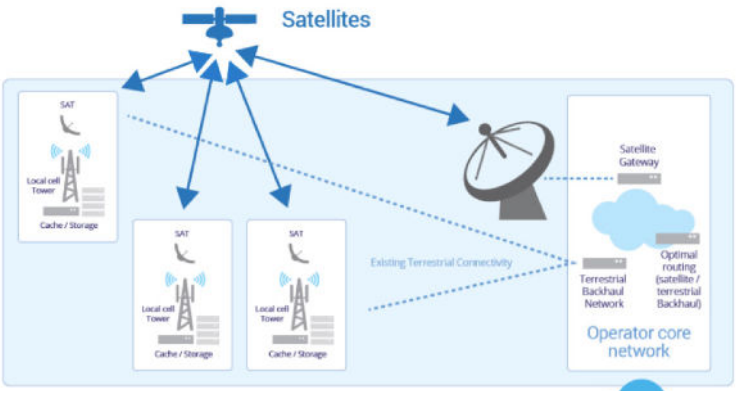
In a conventional satellite network, an internet service provider / network operating centre is connected to the internet via fibre-optic cables. A satellite that is orbiting the earth will receive radio transmissions from ISP gateways and transmit this signal to a small satellite dish on the ground, generally positioned on the roof of a house or building. The satellite dish will then connect to a satellite router (similar to a Wi-Fi router). The router will transmit a signal to any device that will enable internet connectivity, such as a phone or laptop.

BACKHAUL

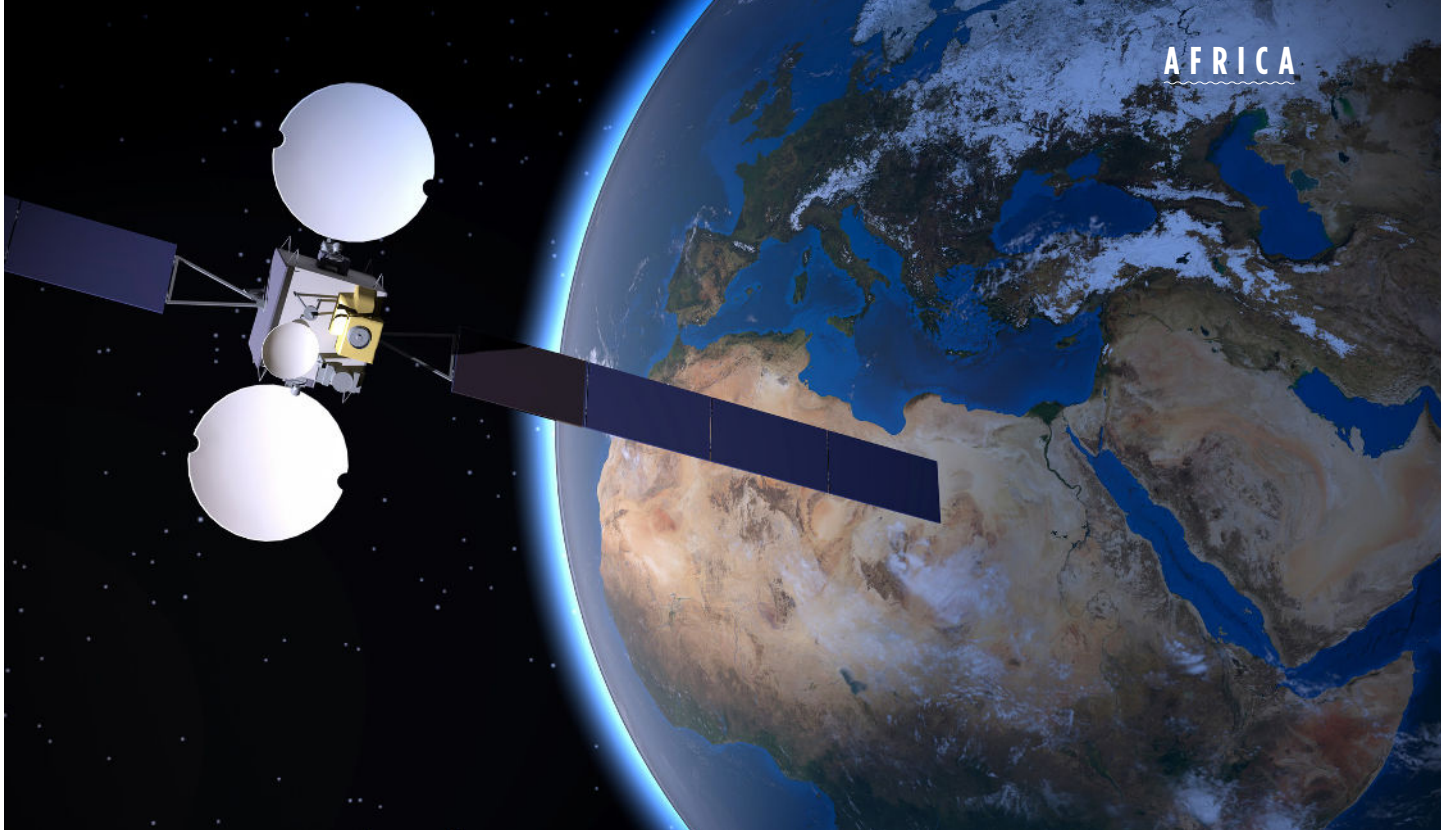
Backhaul (data distribution over a network) is particularly suitable for use in areas where traditional terrestrial connectivity such as fibre, cable, or microwave is too expensive or difficult to install. This includes geographic challenges such as mountains and heavily forested areas as well as most rural areas, where the lower population densities make terrestrial backhaul financially unsustainable. Satellites can backhaul cellular traffic, allowing mobile network operators to carry 2G, 3G, and 4G/LTE traffic. Distance and topography are not constraints when providing backhaul connectivity to hard-to-reach areas. Because satellite coverage is ubiquitous, service providers can connect to any number of rural and remote wireless sites in less time and more economically than if using fibre or microwave.[4]

Satellite backhaul is also used to back up critical sites served by a single fibre or by unreliable terrestrial connections, and in cases of emergency response. If there is an outage, traffic is instantly swapped over to the always-on satellite connection, resulting in little or no traffic loss. Satellite backhaul is a critical component of the wireless terrestrial infrastructure today, and will be vital for 5G.

FIGURE 1: Representative diagram of the backhauling and multicasting tower feed use case



Performance will improve through innovations in space platforms, such as high-throughput satellites, and satellite hubs and modems that incorporate new acceleration technologies. Modern satellite systems make use of smaller antennas which are more readily transported across long distances, require less power to operate and are ideal for solar power supply. New geostationary satellite networks allow bandwidth to be dynamically allocated to rural and remote



network sites across regions using a single pool of satellite capacity. This means that capacity is efficiently utilized based on traffic patterns across the network of sites, ultimately reducing the cost of backhaul per site compared to fibre.

AFFORDABILITY THROUGH INNOVATION

Africa has the most expensive internet in the world. Africans pay on average 8.8 per cent of their monthly income to purchase 1GB of data, compared to 3.6 per cent in Latin America and 1.5 per cent in Asia. In Chad, the DRC, and the Central African Republic, 1GB was found to cost as much as one-fifth of earnings.[5]

Technological developments in low orbit satellites, geosynchronous orbit (GSO) and non-geostationary orbit (NGSO), as well as mega-constellations (groups of satellites that work together as a system), will continue to make satellite connectivity more affordable and accessible. SpaceX's Starlink, Iridium, Boeing, Orbcomm, GlobalStar Amazon, OneWeb and Telesat are all working on this. Intelsat, through its fleet of EPIC GSO satellites, has contributed to significant satellite connectivity cost reductions. Further efficiencies will come from software-defined satellites that can refresh and reconfigure themselves based on demand.

> **"Africa has the most expensive internet in the world."**

LEO AND HYBRID

Low earth orbit (LEO) satellites operate only a few hundred kilometres away from the Earth compared to traditional geostationary satellites, which are generally at 35,000 kilometres. Since LEO satellites are smaller and closer, they require less time and power to send signals, significantly reducing costs. Inmarsat has hybrid constellations of highly elliptical orbit (HEO), geostationary orbit (GEO), and LEO satellites, resulting in a more affordable service offering. In Australia, two geostationary Sky Muster satellites are providing services to over 100,000 points in rural and remote areas.

DIRECT CONNECTION

Another approach is to eliminate the need for satellite-dedicated receivers and instead enable satellite-to-cellphone connectivity. While phones with this capability are already on the market, projects have to comply with existing regulations in the same frequency bands.

BRIDGING THE URBAN-RURAL DIVIDE

In 2021, Eutelsat launched Konnect, its satellite broadband initiative in Africa. Konnect delivers easy, affordable and fast internet, creating new digital highways that terrestrial networks cannot reach. In Tanzania Eutelsat Konnect partnered with Vodacom to extend internet access to businesses operating in rural areas. This partnership will enable Vodacom to provide 100 per cent coverage of the country, connecting every previously unconnected area.[6] In Nigeria, Eutelsat undertook a similar partnership with Globacom to provide connectivity in underserved areas throughout the country.[7]

Similarly, Gilat Satellite Networks, working with Africa Mobile Networks (AMN), has established Africa's largest satellite cellular backhaul network, extending coverage to several African countries. AMN works with telcos and builds mobile network base stations that serve rural communities with no exisitng service in sub-Saharan Africa.

In Benin, AMN installed a base station that utilizes a solar-based electrical power system and a satellite-based backhaul communication link to make the base station completely autonomous with no reliance on local infrastructure. The base station can deliver service to a range of up to 7 km and covers 150 square kilometres.[8]

FIGURE 2. AMN base station in Benin.

Source: VNL

FINTECH AND MOBILE BANKING

Traditional banks, mobile money companies and fintech applications only function if they and their users have connectivity. SatADSL, a Belgian-based satellite operator, has designed a cost-effective ATM solution to enable financial institutions to roll out their networks in urban, suburban and rural areas. The solution facilitates the secured execution on a real-time basis of every transaction from a large and scattered network of ATMs. Ecobank, the largest bank in Africa, has chosen SatADSL's solution to roll out its ATM network across Ghana.[9]

In 2017, MTN launched MTN Mobile Money (MoMo), a secure electronic service that enables wallet holders to store funds, send and receive money, make payments and undertake many other transactions using their mobile phones. Payment is simple, convenient and affordable. The service is offered in partnership with over ten banks in several countries across Africa.[10] In Uganda, MTN made use of Intelsat's satellite backhaul connectivity to provide mobile connectivity services to Ugandans in rural areas, enabling them to receive and make payments via the MoMo app. Cross-border payments are also critical for the success of the African Continental Free Trade Area, which seeks to accelerate intra-Africa trade from its current 2 per cent.[11] Fintech companies OPay and Wave have achieved remarkable success in this space, reaching the status of 'unicorn' (a billion-dollar valuation) in 2021.

"Cross-border payments are also critical for the success of the African Continental Free Trade Area."

ENCOURAGING SATELLITE CONNECTIVITY

The 2023 World Radiocommunication Conference, WRC-23, will review the regulations and policy governing geostationary and NGSO satellite orbits. African administrations like the African Telecommunications Union (ATU), and regional associations like ECOWAS, SADC and EACO must recognise the economic and social role that satellites play in Africa. Satellites usually have a lifespan of 15 years or more and require large initial investment. Administrations need to implement a transparent and durable regulatory framework for satellite services, providing the certainty necessary to support long-term investment. Policymakers should also aim for harmonisation of the frequency allocation and licensing process across African jurisdictions. A first step was taken by the ATU in 2021 with the establishment of a task group which developed a framework for satellite licensing among the ATU Member States. The framework is not binding, but states can use it as a guideline for developing and implementing their own regulations.

The ATU recommended that a separate group should address a harmonised approach to regional licensing and seamless movement of earth stations in motion (ESIMs) among ATU Member States. (ESIMs are earth stations that communicate with satellite systems to provide high bandwidth internet services to mobile platforms such as ships, aircraft, and land vehicles.[12])

SPECTRUM

Demand for mobile data is rising rapidly and requirements for spectrum will change over time. MNOs and manufacturers are constantly pushing for additional spectrum to meet this increasing demand. 4G deployments need to continue before focus can shift to investments in 5G infrastructure. Although adoption of 5G services will depend on the cost of end-user devices and the development of the IoT and machine-to-machine services, the GSMA's estimates indicate that 5G will represent 12 per cent of total connections by 2025, while 4G adoption is forecast to rise from 55 per cent in 2020 to 67 per cent over the same period.[13] Meanwhile, Africa today has access to the 3.3-3.4 GHz band. This band is much less used by mobile services and could represent a less contentious sharing environment with existing services both in-band and in adjacent band regimes.

A regulatory framework that encourages satellite connectivity should also consider the following:

- *Spectrum availability:* The retention of C-band spectrum for satellite operators is critical to the success of the industry. There are currently over

200 satellite operators making use of C-band spectrum. With its propagation characteristics and resilience to rain fade, the C-band spectrum is unique in its ability to provide robust wide-area coverage. Spectrum in the L, S, X, Ku, and Ka bands should also be available for use by satellite operators where there are no alternative frequency bands to which they can migrate their services.

- *Spectrum fees:* Reasonable spectrum fees are an important input towards making satellite communications affordable and an effective solution to the digital divide. As a general principle and a matter of good economic governance, regulatory fees are best kept to a level that allows governments to recoup administrative costs covering, among others, imports of equipment, technology, type approval, licensing charges and the functioning of the national authorities.
- *Emerging technologies:* As with all digital technology, the satellite industry is constantly upgrading its systems and technology to enhance its efficiency. Emerging technologies such as ESIM need to be integrated into regulatory frameworks. The stations can operate in the same frequency band and with similar technical and operational characteristics, allowing them to be licensed under a single regime. The introduction of a blanket licence reduces the administrative burdens for both regulators and applicants.
- *Terminal type approval:* The identification and authorisation of terminals are fundamental features for the smooth operation of satellite systems. The licensing process should be clearly articulated and harmonised as much as possible across the region.
- *Affordable tariffs:* The different architectures of satellite systems mean that elements can bear differing costs. The identification and billing of calls require agreements to ensure that they are affordable and utilized by as many citizens as possible. Regulators need to recognise that interconnection fees, government charges and transit fees all influence affordability. Special rates for local or community communications can promote affordable services in rural areas.

BUILDING CAPACITY AND SHARING KNOWLEDGE

The transfer of strategic, technical, and managerial knowledge is important for African governments and regulators, and can be developed between satellite operators and national authorities. Satellite entities should pledge, as part of the introduction of satellites in a country, that such transfers should take place. Knowledge transfer should cover such subjects as engineering, maintenance, operations, marketing, and billing. Satellite operators should adopt ways and means to transfer know-how effectively and efficiently, including through national ICT forums, special training programmes and capacity-building partnerships with regulators.

UNIVERSAL SERVICE FUNDS

A strategic and efficient deployment of USF allocations can fast-track the journey to universal connectivity. Satellite connectivity should be made eligible for funding and best practices adopted. These include a culture of stakeholder consultation, a clearly articulated mission and objectives, neutrality, transparency, and accountability in service deployment as well as a fair and objective project selection and resource allocation process.

SUMMARY

Satellite connectivity can play a transformational role in enabling more Africans, in both rural and urban areas, to access the internet and unlock all the opportunities linked to the digital economy. Satellite connectivity can improve education, by streaming educational content, and make payments possible through mobile operators who make use of satellite backhaul technology or through the connectivity they provide directly to ATMs and banks. Satellites also have a critical role to play in mitigating climate change – satellite imagery and data can track deforestation and alert governments to imminent danger. Governments are making use of the internet to provide services to their citizens; satellite connectivity helps make this possible in rural areas, where terrestrial infrastructure is either unfeasible or too expensive.

African policymakers and regulators can support the satellite industry by creating a progressive regulatory framework that clearly articulates the compliance requirements and provides the required spectrum at a reasonable cost. Lastly, the industry needs to ensure that it transfers its knowledge and best practice to African satellite operators and regulators, ultimately promoting the growth of Africa's home-grown satellite industry.

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This article is an extract from the paper, 'Satellite Connectivity: The key to Africa's digital transformation?' The full report is available at: https://www.intelsat.com/resource/white-paper/satellite-connectivity-the-key-to-africas-digital-transformation/

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