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1 Open banking

A regulatory perspective

Providing third parties with direct access to banking data can increase competition, encourage innovation and improve customers' outcomes. This has led UK authorities to play a proactive role in the development of an Open Banking Standard.

Encouraging innovation and competition

Open banking initiatives grant third parties direct access to banking data through the use of Application Programming Interfaces (APIs). These allow different software applications to communicate with each other and exchange data directly, without the need for human input each time. APIs can help customers share their transactional data with other players or initiate transactions (e.g. credit transfers) via third party applications. From the regulators' perspective, this kind of "openness" of the banking system can increase competition, encourage innovation and improve customers' outcomes.

Data have always been a source of competitive advantage in almost any industry, and their relevance is growing due to the increase in digital activity, greater data processing capabilities and new analytical techniques. All these trends have given rise to the highly popular concept of "big data". If appropriately used, data provide knowledge of the market as well as of individual customers' conditions, allowing firms to take strategic decisions, make individually tailored offers or conduct creditworthiness assessments. The latter, for instance, is particularly relevant in the lending business and provides a competitive advantage to lenders with established customer relationships. If new providers cannot get access to relevant data for assessing credit risk, —or if access is relatively difficult, these information asymmetries may create barriers to entry and restrict competition. APIs can avoid this happening by allowing customers to share their banking data, in a standardised format, with other providers.

The degree of competition in a market also depends on consumers' ability to compare prices and quality of different products and services as well as on the ease of switching between providers. In recent years, online comparison services of financial products have flourished. They provide customers with basic comparisons of current accounts, deposits, insurance, credit or investment products. These comparisons could be enhanced and made more individually tailored if customers could easily share their banking data via APIs. Moreover, APIs can facilitate switching providers by allowing customers to take their historical banking records with them, not losing information when they move from one service to another.

APIs can also benefit consumers by facilitating innovation in financial services. Having access — with customers' consent — to account information or banking functionalities allows existing or new players, commonly known as FinTechs, to develop innovative value-added services to the benefit of consumers. These range from new payment services, which initiate credit transfers on behalf of the user, to financial advisory services that, based on the information they compile from the user's bank accounts, provide him with financial management tools, alerts or personalised suggestions. APIs may also facilitate direct connection of accounting software services for SMEs with the firm's bank accounts, removing manual tasks and potential human error.

As already explained, from the regulators' perspective, granting third parties access to banking data and processes encourages innovation and competition. However, why should APIs be used instead of relying on other mechanisms for accessing or exchanging data? Firstly, APIs allow the communication between the bank and the third party to be direct, automatic and in real time. In contrast, when data files are manually downloaded and uploaded to third parties by customers, there is a risk of information being altered, and shared data cannot be automatically updated. Secondly, when APIs are used, third parties do not need to access sensitive login details or passwords, and users have full control over which data they are sharing and

for how long, in contrast to what happens when third parties use “screen scraping” to access customers’ bank accounts. The ongoing use of this mechanism by services that aggregate bank account information raises security concerns.

Pioneering regulatory initiatives

In the European Union (EU), the new Payment Services Directive (PSD2), which will come into force in 2018, will require banks to grant licensed third parties access to bank accounts when authorised by the clients. To that end, the Directive introduces two new categories of payment service providers: account information service providers and payment initiation services providers. The former will be able to access only the information from designated payment accounts and associated payment transactions. The latter will be able to initiate credit transfers on behalf of the user. Both types of providers will have to be licensed, with more stringent authorisation requirements for payment initiation service providers since they will be able to initiate transactions and not just access data.

PSD2 sets certain rules on access to accounts by third parties, such as the explicit consent of the user, secure communication among all parties and the ban on using, accessing or storing any data for purposes other than providing the account information or payment initiation services. Moreover, banks will have to treat payment orders transmitted through a third-party without any discrimination in terms of timing, priority or charges with respect to payment orders transmitted directly by the payer. However, the Directive does not specify the technical mechanism through which access to accounts will have to be granted, and the European Banking Authority (EBA) is currently working on the Regulatory Technical Standards (RTS) for strong customer authentication and secure communication.

The United Kingdom (UK) is going a step beyond PSD2 by developing an open API standard in banking: a publicly available and single mechanism for data sharing in the financial sector. This will avoid the development of different API interfaces by each financial institution, which would make effective access to data more difficult and would limit innovation.

In August 2015, the UK’s Treasury launched a joint industry and government initiative, the Open Banking Working Group (OBWG), to deliver a framework for the design of an open API standard in UK banking, focusing on personal and business current accounts. In February 2016, the OBWG released its final report with a proposed four-step calendar to fully implement the open API standard by Q1 2019.

However, in May 2016, in the context of a retail banking investigation, the UK's Competition and Markets Authority (CMA) released a provisional decision on remedies which includes requiring the nine largest retail banks to adopt and maintain common API standards by January 2018. According to the CMA, this measure has the greatest potential to transform competition in retail banking markets, by making it much easier for both personal and business customers to compare what is offered by different banks and by paving the way for the development of new business models offering innovative services to customers.

As a first step, product information (prices, charges, terms and conditions and customer eligibility criteria) and reference data (e.g. branch and ATM location) will have to be available via API services by Q1 2017. Full access to customers’ transaction data sets and write functionality (e.g. payment initiation) will have to be up and running by January 2018 at the latest. Before then, banks will have to agree with the Government the composition, governance, funding and budget of an entity in charge of defining, implementing and maintaining the open banking standards.

The question remains open as to whether the EU will follow the steps of the UK and develop open API standards as an effective and secure way of implementing the PSD2 mandate and further opening the banking system. As shown by the UK, competition and innovation objectives can lead regulatory authorities to play a proactive role in the development of open banking standards.

2 E-Banking in Spain: generational approach

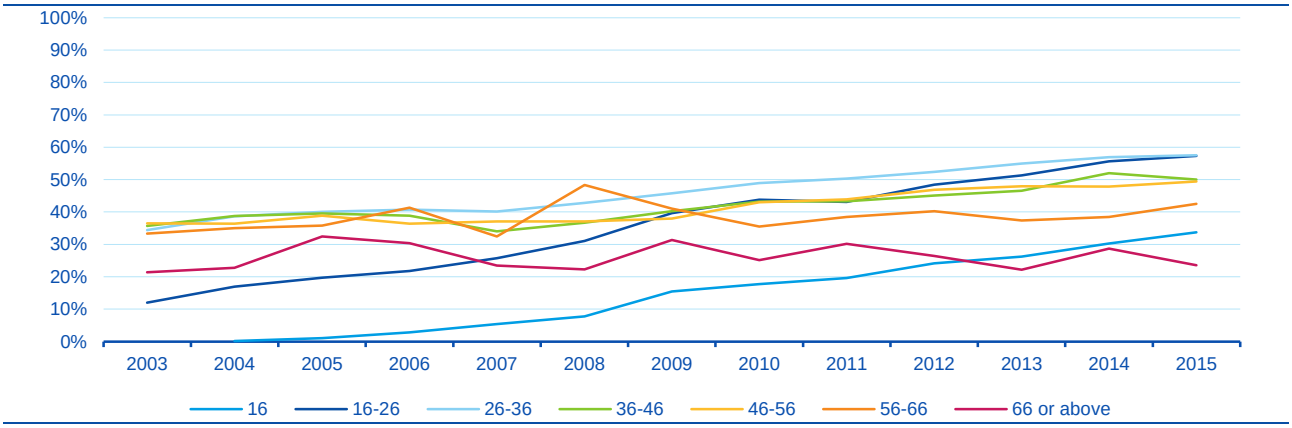
E-banking in Spain by age and education

E-banking is a clear indicator reflecting the approach of the financial system to the ICT sector in order to provide a new communication platform for banking users. E-banking has spread in Spain between 2003 and 2015, but irregularly by age and educational level of the Internet user. These results suggest the need for greater effort regarding those who least use it: the less well-educated and older people.

User generations

Through the Survey on Equipment and Use of Information and Communications Technologies in Households (ICT-H) of INE between 2003 and 2015, groups of people aged over 15 in 2003 were generated, at ten-year intervals except for people aged over 65. From this classification, these groups are sorted by generation of Internet user. They show the evolution in the behavior of these groups in the use of e-banking services. Figure 1.1 shows the evolution of responses to the question of whether the person, who has used the Internet, has also used these services in the last three months from the date of being surveyed.

Figure 2.1
Age distribution of Internet users for e-banking (%), 2003-2015



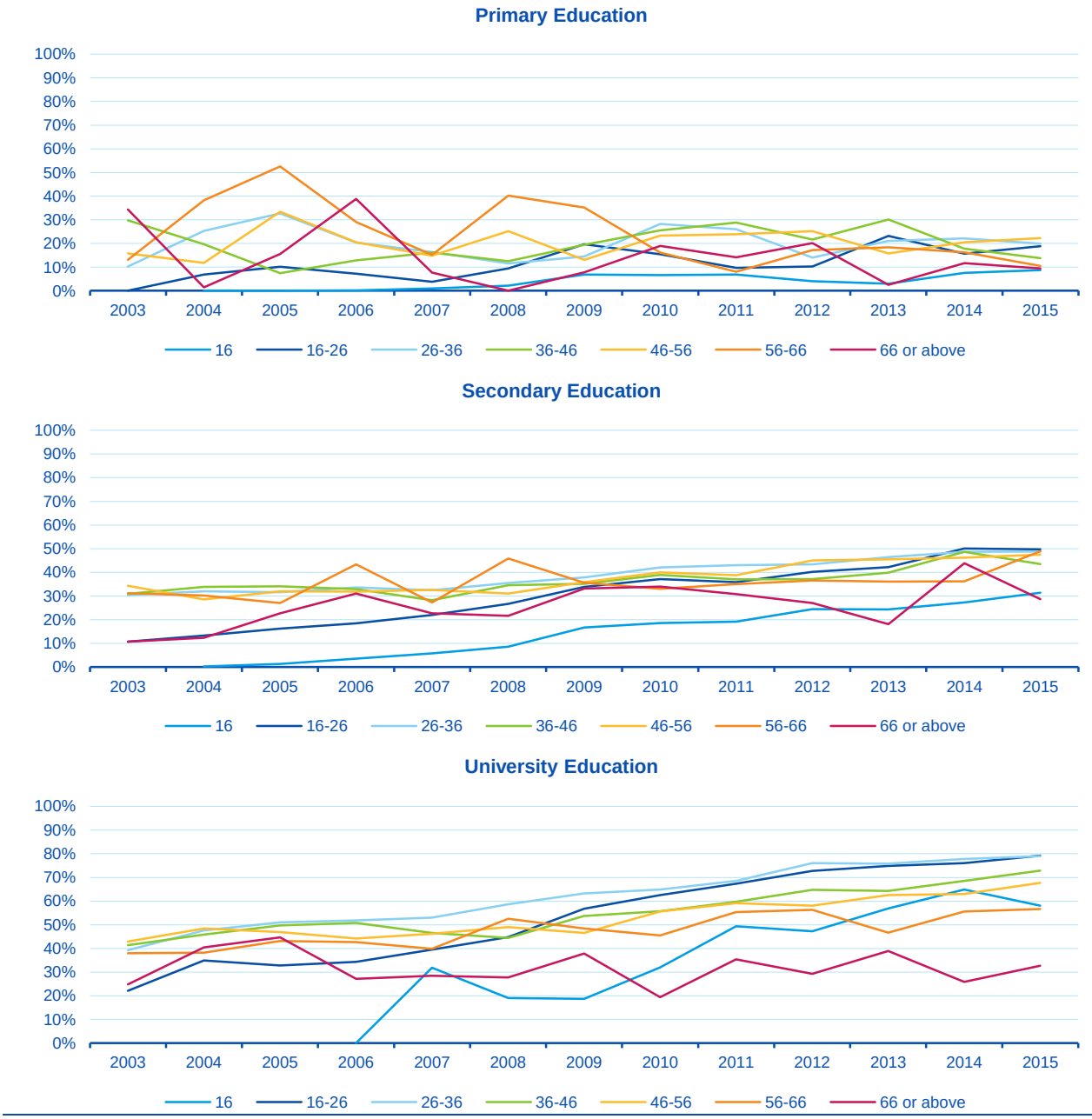
Source: BBVA Research based on ICT-H (INE)

The results confirm a dichotomy in the evolution of e-banking use between 2003 and 2015: the percentage use of e-banking increases for people below 56 years old and remains stable for users aged over 56. Not all age ranges showed a similar situation in 2003. The lowest use of e-banking in younger groups is associated with reduced levels of income. In the case of older Internet users, they are traditionally more reluctant to use ICT and these types of services. The other ranges show little differences, each group being around 35%. The growth rate was different between intervals, generating changes in the relative position of the age groups. Over time, people below 26 years old enter the labour market en masse, so that the largest increase is observed in the use of e-banking. The population of average age is active in the labour market right through the period of study, and its growth would be lower due to the diffusion process of e-banking, reaching over 50%. The population groups of over 56 year olds are leaving the labour market and show stagnation, conditioned by their respective past history of e-banking use.

Education and e-banking

The results in Figure 1.2 confirm that the level of education (partly related to income level) is a relevant variable. Three levels are considered: Primary or lower Education, Secondary Education and University education.

Figure 2.2
Age distribution of Internet users for e-banking (%), 2003-2015



Source: BBVA Research based on ICT-H (INE)

There is a positive relationship between educational level and the percentage of Internet users who use online banking services. This effect is greater when younger users are considered. People with a university education reach percentages, which are close to 80% in under 36 year olds excluding the youngest group. However, the group does not exceed 25% in those with primary studies. Dispersion by age clearly grows with educational level, especially when compared to the group that is between 17 and 36 years old in 2003, except for the population above 65 years old.

3 The Internet of Things: European regulation

The Internet of Things extends objects' Internet connectivity and presents a set of new regulatory challenges and opportunities

With the aim of leading the technological change arising from this disruption, the European institutions, in many respects, lead the regulatory framework of this technology and its derivatives.

Introduction

The Internet of Things (IoT) represents a new stage on the path to the digital transformation of society. According to the International Telecommunications Union (ITU), the IoT is defined as a worldwide infrastructure for the information society allowing access to advanced services by means of the physical and virtual interconnection of things, based on existing and evolving interoperable information and communication technologies[1]. Nonetheless, we have to speak of a whole Internet of Things galaxy, since it comprises all the groups of technologies (ubiquitous computing, radio-frequency identification - RFID - and machine-to-machine - M2M - communications, among many others) needed for the development and functioning of the IoT.

According to a report by the consultant IDC[2], in 2020 there will be around 50 billion devices connected to the Internet, ten times as many as at present. This will mean that, on average, each person will have six connected devices, twice the number for 2015. In accordance with these predictions, the McKinsey Global Institute[3] estimates a potential economic effect (Gross Value Added) of between USD 2.7 and USD 6.2 trillion a year by 2025. This will affect not just users' consumption habits but, globally, all economies capable of leading technological change.

Thus the IoT involves the creation of a new social, political and economic landscape, and in order to ensure the implementation and development of this new technology, the political decision-making bodies will have to be capable of regulating a whole package of regulations relating to the IoT. These will range from R&D and industrial development policies to aspects relating to the protection of users and their data, identity and security.

The European Union as regulatory benchmark

Europe offers great opportunities for the adoption of new technologies and services as a solution to the challenges faced by society. The European Union started preparing for the age of the IoT ten years ago, with the launch in 2005 of *i2010 -A European Information Society for growth and employment*. This established key policies for developing the Single European Information Space, innovation and investment in research and inclusion and better services and quality of life.

Subsequently, the areas of regulation were gradually increased by means of various directives, prominent among which are those relating to standardisation, privacy and data protection, cybersecurity and cybercrime, infrastructure and R&D&i.

1: *The Internet of Things — Machines, businesses, people, everything*, ITU News, 2013.
2: Claps, Massimiliano, *Business Strategy: The Coming of Age of the "Internet of Things" in Government*, IDC Government Insights, 2013.
3: Manyika, Michael Chuim et al., *Disruptive Technologies:Advances that will transform life, business, and the global economy,* McKinsey Global Institute, 2013.

The regulation of the IoT requires decisions to be taken both on the devices connected and on the networks and their security and the data associated with the devices. Some of the most notable recent directives in these areas are:

- In the field of **standardisation**, **Directive 2014/53/EU** on the harmonisation of the laws of the Member States relating to the marketing of radio equipment is fundamental for the joint and harmonised development of technology.
- As regards **privacy** and **data protection** and **ownership**, in 2018 the new General Data Protection Regulation (GDPR), a single set of rules directly applicable across the EU, will replace the 1995 Data Protection Directive.
- **Cybercrime** is addressed in **Directive 2013/40/EU** on attacks against information systems, which establishes minimum rules concerning the definition of criminal offences and the relevant sanctions in the area of attacks against information systems, while **cybersecurity** is dealt with the recently adopted the Network and Information Security (NIS) Directive. The basic objective of this Directive consists in ensuring a high common level of network and information security across the Union and increase the coordination between all Member States.
- The **infrastructure** necessary for the development of the Internet of Things has been promoted by various measures, notably the Connected Communities Initiative which allows for different systems designed to put different municipalities in touch with one another and in turn to put different local broadband agents and operators in touch with advisors who can help them choose the best way of obtaining financing or developing tailor-made business models to deliver broadband to their communities.
- Lastly, the most high-profile **R&D** promotion measure is the Europe 2020 "Innovation Europe" initiative, as well as the various methods of financing innovation through the Framework Programmes and, specifically, the last one, also known as Horizon 2020.

Table 3.1
Summary of IoT policies in the European Union

Standarisation	Privacy and data protection	Cybercrime and cybersecurity	Infraestructure	R&D
Standarisation legislation not exclusive for IoT	General Data Protection Regulation(GDPR)	Network and Information Security (NIS) Directive	Connected Communities Initiative	Framework Programme Funding

Source: BBVA Research

A long way to go

The EU is consolidating its position as one of the economic areas with the greatest future projection in emerging technologies and as an international benchmark thanks to European Commission (EC) actions as regulatory agent. This makes it possible to play a significant role in international coordination issues such as the standardisation of technology.

Nonetheless, the EC will have to launch new measures designed not just to regulate the IoT ecosystem but to boost the economic activity arising from it, promoting European companies' international competitiveness. With the solid bases of a legislation that is protective of users and their privacy, now is the time to focus efforts on increasing R&D&i and bringing investment, both public and private, up to figures similar to those of the leading countries, as well as incentivising and leading the knowledge- and creativity-based economy, as opposed to specialising in mass production.

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