

# OPEN STANDARDS FOR DATA

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## Evaluating the economic and social returns

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## EXECUTIVE SUMMARY

Open standards for data are “reusable agreements that make it easier for people and organisations to publish, access, share and use better quality data”.<sup>1</sup>

Open standards can potentially ensure that more information and insights are available to end users, make sectors more competitive, and help support an ecosystem of innovative new businesses. As a result, standards can be expected to have important social and economic returns.

However, establishing a robust link between standards and these returns can be challenging and requires careful consideration of the mechanisms by which the standard contributes to these impacts and the appropriate counterfactual (what would have happened in the absence of the standard).

The Open Data Institute (ODI) commissioned Frontier Economics to conduct an evaluation of the social and economic returns to open standards for data. In particular, the ODI was interested to understand the returns that could be attributed to:

- the development and implementation of open standards for data; and
- the ODI’s contribution to developing and implementing open standards for data.

We addressed the research question in two phases. First, we developed a **theoretical economic framework** to describe how open standards might be expected to drive social and economic impacts. Second, we conducted **two case studies** to test the economic framework in the context of real-world standards.

We designed this approach for a number of key reasons:

- Developing a robust economic framework to describe the channels through which standards drive impacts ensures that the evaluation is grounded in economic theory and that it considers the barriers and market failures that prevent firms from delivering these impacts in the absence of the standard.
- Open standards for data aim to achieve a diverse range of social and economic impacts, from reducing public transport travel times to helping governments share tenders efficiently. A case study approach to understanding the returns to specific standards was therefore preferred to a one-size-fits-all approach to the impact of open standards in general.
- Even for specific standards, a purely empirical approach to quantifying the returns would require a large number of assumptions and would be unlikely to provide credible evidence. We therefore preferred to combine qualitative and quantitative evidence to describe the impact of each standard and the ODI’s contribution to its development and adoption.

While we are not able to draw general conclusions about the aggregate impact of all open standards for data, the economic framework and logic model we have developed for this study is widely applicable. It describes the mechanisms by which standards deliver outcomes and impacts and could be applied in future to other open standards for data.

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<sup>1</sup> Open Data Institute, ‘Open Standards for Data Handbook’, Retrieved from <https://standards.theodi.org/>.

We have applied this framework to two case studies to identify the potential returns associated with their development: the OpenActive Standard and the Open Banking Data Standard. High level comparisons between these two case studies provide some insights as to where open data standards are likely to be more or less important.

### Economic framework

Our economic framework sets out the logic for how a policy intervention *is expected* to generate particular outcomes and impacts. It is considered best practice to have this theory developed from the inception of the evaluation to help objectively develop hypotheses and evaluation questions which can be tested with evidence.

The full logic model is presented as Figure 1. The model describes how **activities**, including the provision of delivery, advisory, guidance and advocacy support, along with regulation and other external factors, facilitate the development and adoption of open standards (**outputs**). Once adopted, these standards can drive a range of **outcomes** which we group into three broad theories of change:

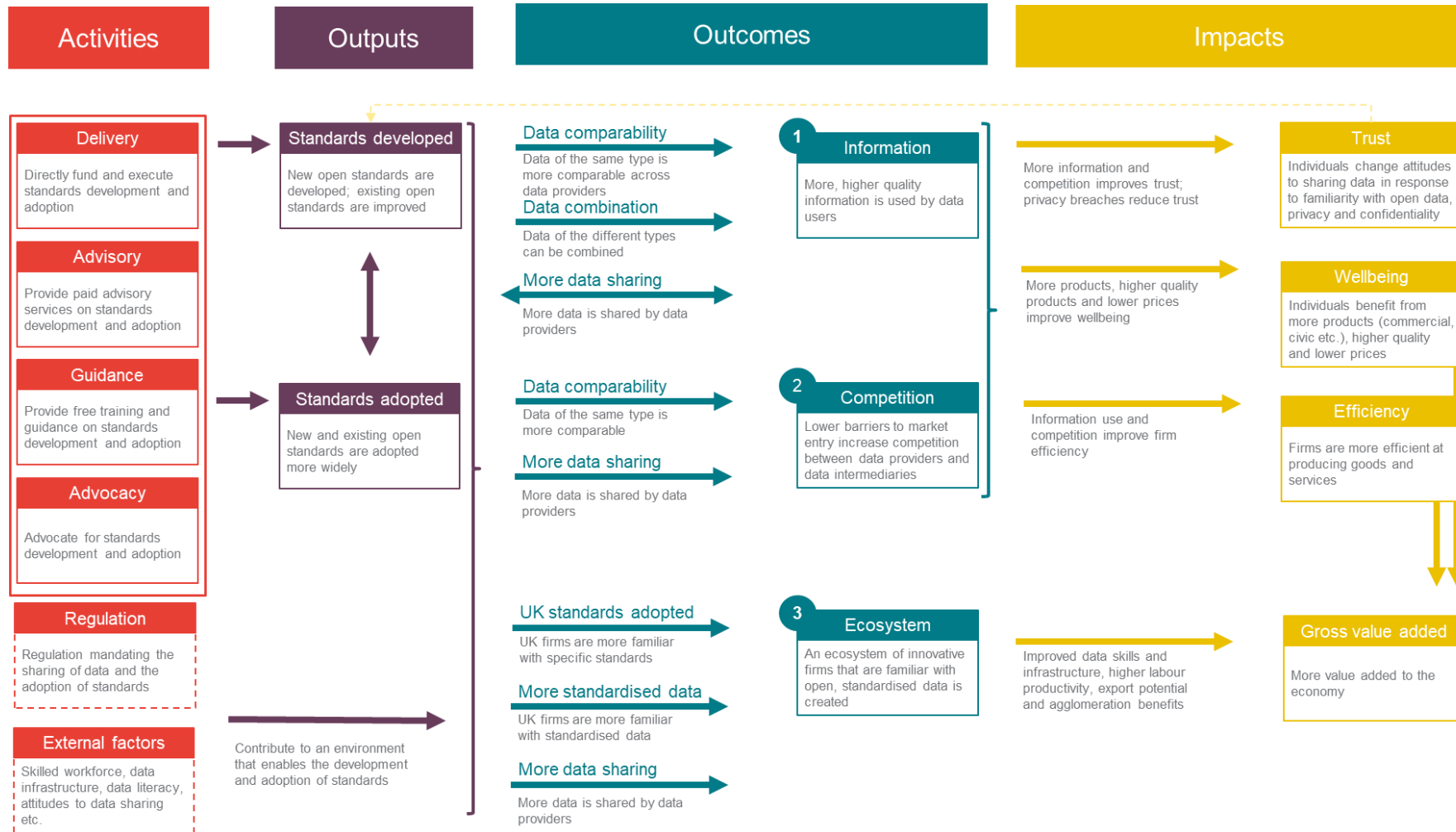
- **Information theory of change.** Because of standards adoption making data more consistent, existing data is more easily compared and combined by data intermediaries, and more data is shared by data providers. As a result, more insight and information are available to end users. This information is of a higher quality and is more up to date.
- **Competition theory of change.** Standards lower barriers to market entry for – and increase competition between – data providers (organisations that hold the data) and data intermediaries (organisations that transform the data to make it useful). Competition effects are most likely in sectors where a small number of large firms hold commercially valuable user data. When coupled with required regulation, open standards can make it harder for these firms to hoard data and easier for new firms to enter and compete.
- **Ecosystem theory of change.** Locally developed standards facilitate the development of a self-perpetuating local ecosystem of innovative firms that are familiar with standardised data. This benefits local and national economies in the aggregate, not just the organisations and individuals directly involved with the standard.

Each theory of change results in a range of potential social and economic **impacts**, including those related to trust, individual wellbeing, organisational efficiency.

- More trustworthy information sharing and transparent competition can increase the trust that individuals have in the organisations that handle their data.
- Individuals can benefit by having more, higher quality products and services available at lower prices.
- Organisations can benefit by increasing their efficiency and productivity, driving up wages and profits.

Importantly, open standards for data are not necessarily sufficient for these impacts on trust, individual wellbeing and organisational efficiency—they also depend on a range of wider conditions (regulation, data infrastructure, consumer protection, etc). Ultimately, these impacts can translate into an increase in the gross value added to the economy through increased productivity or consumption.

Figure 1 Logic model: the social and economic returns to open standards for data



Source: Frontier Economics analysis

## OpenActive case study

The OpenActive Opportunity Standard was developed as part of the wider OpenActive initiative, which sought to reduce physical inactivity by addressing practical and behavioural barriers.

Through the standard, activity providers (e.g. leisure centres) open up physical activity opportunities data to be re-purposed by activity finders (services and online platforms helping users find activities).<sup>2</sup>

We evaluated the impact of the standard by comparing the current OpenActive ecosystem to two counterfactual scenarios: a *data wasteland* counterfactual and a *data oilfield* counterfactual.

- In the data wasteland counterfactual, opportunities are shared bilaterally between activity providers and activity finders, and many organisations still rely on websites, social media pages or printer flyers to market their opportunities.
- In the *data oilfield* counterfactual, a handful of well-funded data intermediaries establish themselves as two-sided platforms: collecting data from activity providers, standardising it manually, and offering information to users in exchange for a booking fee.

Evaluating the impact of the standard against these possible counterfactual scenarios allows us to present upper- and lower-bound estimates of the effect of the standard, while acknowledging the uncertainty in our conclusions.

**Our work suggests that the standard is likely to contribute to an increase in physical activity levels**, primarily because of more information on opportunities reaching individuals (particularly those who would otherwise have been inactive). This effect is expected to be larger if we believe that the *data wasteland* counterfactual is more likely, and smaller if we believe that the *data oilfield* counterfactual is more likely.

The ODI designed and developed the standard and stewarded the OpenActive initiative as a whole, as well as advocating for standards adoption in the wider community and helping organisations adopt the standard. **It is, therefore, reasonable to conclude that a large share of the outputs, outcomes and impacts associated with the standard could be attributed to the activities of the ODI.**

An overview of these outputs, outcomes and impacts is presented below.

**Outputs.** Since its launch, the standard has been voluntarily adopted by 19 activity providers and 10 activity finders, publishing approximately 200,000 physical activity opportunities per month.<sup>3</sup>

**Information.** Case study evidence, including from stakeholder interviews and monitoring data, suggests the OpenActive standard allows activity providers to share more opportunities data and enables activity finders to increase the visibility

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<sup>2</sup> Also referred to as Data Users in ODI's terminology.

<sup>3</sup> OpenActive, 'Opportunity Data Dashboard', Retrieved from <https://status.openactive.io/>



these opportunities, reaching new individuals with activities that are tailored to their needs.

We find qualitative and quantitative evidence that this increase in available information is likely to have contributed to an increase in physical activity levels in the UK above what would have been expected in either of the counterfactual scenarios. Activity providers saw an increase in utilisation when listing opportunities through the standard, and activity finders noted that a substantial share of users proceeded to book the opportunities that they saw. The standard has enabled these effects by reducing frictions in data sharing, increasing user understanding and diversifying user reach.

Using evidence from the case study and the literature, we estimate that the 200,000 opportunities published through the standard per month are likely to result in 150,000 to 500,000 new physical activities taking place per month. This is equivalent to 17,000 to 58,000 newly active individuals, or 0.1% to 0.3% of the previously inactive population. This implies that the standard could be responsible for avoiding up to 110 premature deaths per year, up to £3 million in health cost savings and up to £20 million in increased productivity. The underlying calculations and sources for these estimates are presented in the box below.

**Competition.** Case study evidence suggests that the standard currently impacts competition primarily at the activity finder level, with limited impacts at the activity provider level.

There is evidence that the standard might increase competition in the activity finder market compared to what would otherwise have been expected by enabling a range of non-commercial organisations to operate, particularly compared to a *data oilfield* scenario. By lowering fixed costs, it is likely that the standard mitigates the risk of a small number of platforms gaining market power in the activity finder market, and shields users from harmful long-run effects (increased prices, fewer activities to choose from and lower service quality).

Stakeholders also told us that the standard reduces administrative and marketing costs compared to both counterfactuals.

By reducing costs and stimulating greater competition between activity finders, the standard may reduce total activity costs faced by users, both in terms of booking fees that might otherwise be paid to activity finders and activity fees paid to activity providers. This is likely to further increase levels of physical activity.

## EXAMPLE: IMPACT ON PHYSICAL ACTIVITY

The quantitative evidence collected in the case study allows us to estimate the number of new activities generated by the OpenActive standard, using two complementary approaches.

### Outcomes: Approach 1

- Up to 200,000 additional opportunities are published each month because of the standard.<sup>4</sup>
- Knowing that publication increases opportunity utilisation by 10-25%,<sup>5</sup> and assuming that there are 10 participants per opportunity in the absence of the standard, the standard leads to an increase of 1 to 2.5 participants per opportunity.
- This leads to an estimated:
  - $200,000 \times 1-2.5 = \mathbf{200,000 \text{ to } 500,000 \text{ new activities}}$  per month because of the standard.

### Outcomes: Approach 2

- Up to 200,000 additional opportunities are published each month because of the standard,<sup>6</sup> and an average of 63 individuals see each opportunity.<sup>7</sup>
- 40% of opportunities seen by an individual are *new*.<sup>8</sup>
- 3-8% of new opportunities viewed lead to bookings (conversion rate).<sup>9</sup>
- This leads to an estimated:
  - $200,000 \times 63 = 12.6 \text{ million}$  individuals viewing opportunities each month
  - $12.6 \text{ million} \times 40\% = 5 \text{ million}$  individuals viewing *new* opportunities each month
  - $5 \text{ million} \times 3-8\% = \mathbf{150,000 \text{ to } 400,000 \text{ new activities}}$  per month because of the standard.

These different approaches suggest a similar increase in the amount of physical activity, equivalent to **150,000 to 500,000 new activities per month**.

### Impacts

Assuming that the average user of these new activities participates in one activity per week, this implies that 35,000 to 115,000 individuals increase their level of physical activity because of the standard.

If half of these individuals move from being inactive to active (according to Chief Medical Officer guidelines), this is equivalent to **17,000 to 58,000 newly active individuals**, 0.1% to 0.3% of the inactive population. This implies that, given these assumptions, the scale of health and wellbeing impacts might be approximately:

- up to **100 premature deaths avoided** per year
- up to **£3 million per year in health costs avoided**
- up to **a £20 million per year increase in productivity**.

## Open Banking case study

The Open Banking Data Standard (was developed as part of the Open Banking initiative, a wider regulatory framework aimed at facilitating greater competition and market transparency in the retail banking industry).

Under the Competition and Markets Authority's (CMA) Retail Banking Market Investigation Order 2017, the nine largest banks in the UK (the CMA 9 or *regulated* banks) were obliged to grant users the right to share current account data with authorised third-party providers (TPPs) in a standardised way. This went further than the EU Second Payment Services Directive, which did not mandate a particular standard.

We evaluated the impact of the standard by comparing it to a single counterfactual. In the absence of the Open Banking standard, banks would still be required to facilitate data access through open Application Programming Interfaces (APIs) under the EU Second Payment Services Directive regulation. However, without a standardised API specification to follow, banks would be likely to develop their own APIs, and data formats, processes and technical specifications would be likely to differ across providers.

As Open Banking simultaneously mandated both a right to data portability and the data standard, it is challenging to isolate the impact of standards from the impact of mandated data portability. Indeed, many of the stakeholders provided evidence of how Open Banking compares to the manual techniques TPPs previously used to access current account data (for example, screen scraping, where users share their bank username and password with a third party and permit them to access their account).

**Our work suggests that the standard is likely to lead to a small increase in product unbundling within the retail banking sector**, primarily driven by reduced complexity and increased consistency in the journey users must follow to share their data with third parties – a major barrier to the adoption of third-party services. The relative importance of process standardisation in the Open Banking context was an important finding of this study.

While the CMA market investigation provided the impetus for the exploration of open banking, the ODI played an important role in drafting the initial report, establishing the Open Banking Working Group, coordinating stakeholders and developing the framework for the standard. **It is therefore plausible that a similarly robust standard would not have been developed and adopted in a similar timeframe in the absence of the ODI.**

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<sup>4</sup> ODI figures, updated to June 2019.

<sup>5</sup> Playfinder, an activity finder who participated in the case study, reported an 10-25% average increase in overall sessions' slot utilisation, depending on the booking service used.

<sup>6</sup> ODI figures, updated to June 2019.

<sup>7</sup> One OpenActive-based activity finder, since its launch in 2016, has enabled around 8,000 activity providers to publish opportunities through their platform, and registered around 500,000 unique website views. In performing the calculations, we assume each activity provider publishes one opportunity.

<sup>8</sup> Estimates provided by an activity provider.

<sup>9</sup> Playfinder, an activity finder the participated in the case study, reported that 7% of viewed opportunities lead to actual booking on its platform when automated booking was enabled. We used a range of 3-8% to reflect uncertainty and the fact that non-automatic booking approaches are likely to have lower conversion rates.

An overview of these outputs, outcomes and impacts is presented below.

**Outputs.** After the launch of Open Banking in 2018, the largest nine UK banks adopted the standard (as mandated by Open Banking), along with 31 other financial institutions (voluntary adoption). The number of successful API calls, a proxy for the volume of data transferred using the standard, increased to almost 70 million calls per month in June 2019, according to monitoring data from the Open Banking Implementation Entity.

**Information.** Evidence from the case study suggests that, although users benefit from new insight generated by Open Banking products, there is limited evidence that the standard has made a substantial contribution to unlocking these benefits. The standard has had some effect on increasing consistency in how user current account data from different banks is displayed, enabling providers to develop higher-quality account aggregation services for the benefit of consumers.

**Competition.** Evidence from the case study suggests that, while there has been no change in the levels of current account switching, Open Banking has some impact on the competition dynamics of the UK retail banking sector in specific contexts. We conclude that most of these effects are conveyed through the unbundling of financial products, which is expected to facilitate market entry for TPPs. This in turn is likely to reduce the market power of incumbent banks, increasing the overall level of competition in the long run. These findings should be interpreted considering that the case study was conducted in the early stages of the Open Banking implementation and that potential long-run effects may not have been observed.

We considered a particular example of increased product unbundling where there was evidence on the number of individuals signing up to third-party overdraft products with and without standardised app-to-app authentication; an important part of the standard. In this case, standards increased sign-up completion rates by 11.8%, implying that a complicated and inconsistent application process was previously a significant barrier to users sharing their data. We used evidence provided by the TPP to calculate that, in this case, the standard is likely to help 12,000 users save up to £2.2 million per year on overdraft charges. These benefits would accrue even if the standard did not lead to an improvement in the quality or a reduction in the price of the overdraft product. The underlying calculations and sources for these estimates are presented in the box below.

**Ecosystem.** Case study evidence shows that the Open Banking standard has generated substantial cost savings for some TPPs, allowing new and innovative firms to enter the retail banking market and offer diversified products tailored to different user needs. However, examples of innovative products are currently limited, and response to new innovation by existing firms has been slow.

## EXAMPLE: UNBUNDLED OVERDRAFT SERVICES

The FCA considers bank overdraft charges to be excessive, particularly for those with unauthorised overdrafts.<sup>10</sup> Unbundled overdraft services offer an alternative for users to borrow at more favourable rates. These services require access to user current account data to profile the users and identify when they are at risk of going into overdraft. Therefore, a smooth user authentication journey and the seamless transfer of transaction data are vital enablers of these products. Benefits arising to users who access these products because of improvements in the user journey enabled by the standard can therefore be attributed to the standard specifically rather than to Open Banking in general.

**Step 1:** Since the standard's guidelines on app-based user authentication were launched in March 2019, banks who adopted the standard have increased their authentication completion rate for Account Technologies products by 11.8% more than banks who did not adopt the standard.

**Step 2:** Knowing that approximately 10,000 individuals apply for Account Technologies products each month, approximately 1,000 new users per month can therefore be attributed to the standard. Based on evidence on the share of users with access to authorised bank overdrafts, we concluded that 500 of these users were previously using unauthorised bank overdrafts while 500 were previously using authorised bank overdrafts.

**Step 3:** Evidence from Account Technologies and the FCA implies that:<sup>11</sup>

- The average user who was previously using unauthorised bank overdrafts saved **£40-£70** per year from switching to Safety Net Credit.
- The average user who was previously using authorised bank overdrafts saved **£180-£300** per year from switching to Tappily.

**Conclusions:** Using the above evidence, we can estimate that over the course of one year, the standard would help **12,000 additional users save a total of £1.3-£2.2 million per year**. This figure would be expected to increase as the standard enables more users to sign up for the third-party overdraft products (40 million individuals use overdraft services every year).<sup>12</sup>

Given that applicants to unbundled overdraft services like Safety Net Credit and Tappily spent between 4% and 8% of their income on bank charges,<sup>13</sup> estimated savings from switching over to unbundled overdraft services are likely to materially affect users' financial wellbeing, with greater impacts expected for financially vulnerable users.

<sup>10</sup> Financial Conduct Authority, (2018), 'High-Cost Credit Review: Overdrafts Consultation Paper and Policy Statement', Retrieved from <https://www.fca.org.uk/publication/consultation/cp18-42.pdf>

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> Reported by Account Technologies.

## Comparison of findings

While it is not possible to extrapolate from the case studies to form conclusions about the aggregate impact of open standards for data, we are able to make a number of high-level observations about the likely returns to different open standards by comparing the two case studies.

In principle, open standards can help drive data sharing, but the degree to which this occurs as a result of a standard alone will depend on:

- the reason why data is not widely shared in the absence of the standard; and
- the extent to which the lack of consistent information available to data intermediaries or end users is the *key barrier* limiting consumer switching between different products.

Where practical or cost barriers prevent data providers from widely sharing data and where such data sharing may increase the value of the data to the provider (e.g. by reaching additional customers in the case of OpenActive), a standard that enables sharing is likely to increase the amount of information available to individuals and may increase competition.

However, where sharing data reduces its commercial value to a data provider (e.g. in the case of Open Banking), open standards alone are likely to be inadequate to bring about data sharing. In these cases, open standards may be a necessary, but not sufficient condition for increasing sharing. They may require accompanying regulation that requires providers to share data.

In cases where a standard (either alone or accompanied by regulation) leads to an increase in data sharing, whether or not an increase in competition follows depends on whether or not data sharing was the key barrier to consumers exercising greater choice in the first place. This can be seen in both the OpenActive and the Open Banking case studies to a degree.

In the OpenActive case study, whilst there may be an increase in competition between activity finders, it does not necessarily follow that there is any substantive increase in competition between activity providers. This very much depends on what causes existing users to switch between different activity providers. Locality is very important in this market and switching is only likely if more convenient, lower cost or higher quality activities are made available to existing users. As yet, there is no evidence that the standard has led to this impact.

In the Open Banking case study, there is no evidence that the standard has increased current account switching and hence competition between existing current account providers. This is likely to be because there are other consumer barriers to switching in this space that the standard does not overcome. The standard can still have positive impacts nonetheless, such as via unbundling of existing products, and may provide necessary conditions for future innovation to happen (e.g. the next generation of account aggregation products), leading to increased switching in the future.

## GLOSSARY OF TERMS

- **Activities:** Actions undertaken by the Open Data Institute (ODI) and other organisations to facilitate the development and adoption of open standards for data.
- **Activity finders (OpenActive):** Those organisations that help individuals to identify and/or book physical activities.
- **Activity providers (OpenActive):** Those organisations that provide or facilitate physical activity opportunities for individuals, including leisure centres, class instructors, venue owners etc.
- **API call:** An instance of data being transferred from a data provider to a data intermediary via an application programming interface (API).
- **CMA 9 (Open Banking):** The nine largest banks and building societies in the UK, based on volume of personal and business current accounts.
- **Data infrastructure:** The data assets, people, processes and technology that help users and organisations make decisions, build services and gain insight.
- **Data intermediary:** An organisation that adds value to data and translates it into information and insight for users.
- **Data provider:** An organisation that collects, maintains and publishes data, making it available for others to use.
- **Data user:** An individual or end user who benefits from information and insight.
- **Economic framework:** A logical framework for describing how activities to encourage the development and adoption of open standards for data are converted into outputs, outcomes and impacts. Also a logic model.
- **Impacts:** The wider social and economic changes that the outcomes of standards development and adoption contribute towards. These impacts may be supported by other factors not considered in this study.
- **Logic model:** See economic framework.
- **Open API:** A free-to-use, publicly available application programming interface that provides developers with access to a proprietary software application.
- **Opportunities (OpenActive):** Instances of physical activity sessions.
- **Outcomes:** The intermediate effects that are driven by the development and adoption of standards.
- **Outputs:** The tangible deliverables that are produced by activities, including the development and adoption of standards.
- **Theory of change:** A particular channel through which activities to encourage the development and adoption of open standards for data are converted into outputs, outcomes and impacts. The Open Standards for Data Logic Model describes three theories of change: information, competition and innovation.
- **TPP (Open Banking):** Third party providers. Organisations that use standardised APIs to access users' accounts, in order to provide account information services and/or to initiate payments.
- **Users:** Individuals or organisations that are the end users and ultimate beneficiaries of open data standards.

# 1 BACKGROUND

**Open standards for data** are “reusable agreements that make it easier for people and organisations to publish, access, share and use better quality data”.<sup>14</sup> According to the Open Data Institute’s (ODI) Open Standards for Data Handbook, standards can:<sup>15</sup>

- ensure a consistent vocabulary and common models, attributes and definitions (defined in registers, taxonomies, vocabularies, ontologies etc.);
- enable the exchange of data within and between organisations and systems using common formats and shared rules (defined in specifications, schemas, templates etc.); and
- provide guidance and recommendations for sharing better quality data, understanding processes and information flow (defined in models, protocols, and guides).

A data standard that is *open* is “available for anyone to access, use or share”.<sup>16</sup>

Open standards can potentially ensure that more information and insights are available to end users, make sectors more competitive and help support an ecosystem of innovative new businesses. As a result, standards can be expected to have important impacts on society.

The ODI commissioned Frontier Economics to conduct an evaluation of the social and economic returns to open standards for data. In particular, the ODI was interested to understand the returns that could be attributed to:

- the development and implementation of open standards for data; and
- the ODI’s contribution to developing and implementing open standards for data.

Section 2 of this report sets out the methodology we used to address the research question. Section 3 presents an economic framework, which describes how open standards might be expected to drive social and economic impacts in theory. Sections 3 and 4 present our findings on the impact of open standards for data, in the context of the two case studies: OpenActive and Open Banking. Section 5 briefly compares the case studies and suggests where these findings may be more or less relevant in other contexts.

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<sup>14</sup> Open Data Institute, ‘Open Standards for Data Handbook’, Retrieved from <https://standards.theodi.org/>.

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.



## 2 EVALUATION METHODOLOGY

We addressed the research question in two phases. First, we developed a **theoretical economic framework** to describe how open standards might be expected to drive social and economic impacts. Second, we conducted two **case studies** to test the economic framework in the context of real-world standards.

We designed this approach for a number of key reasons:

- Developing a robust economic framework to describe the channels through which standards drive impacts ensures that the evaluation is grounded in economic theory and that it considers the barriers and market failures that prevent firms from delivering these impacts in the absence of the standard.
- Open standards for data aim to achieve a diverse range of social and economic impacts, from reducing public transport travel times to helping governments share tenders efficiently. A case study approach to understanding the returns to specific standards was therefore preferred to a one-size-fits-all approach to the impact of open standards in general.
- Even for specific standards, a purely empirical approach to quantifying the returns would require a large number of assumptions and would be unlikely to provide credible evidence. We therefore preferred to combine qualitative and quantitative evidence to describe the impact of each standard and the ODI's contribution to its development and adoption.

### 2.1 Economic framework approach

To inform the development of the economic framework, we conducted a **rapid review of academic and non-academic literature** on the contribution of open standards for data to the local, national and international data infrastructure. We also conducted **stakeholder interviews** with subject matter experts, including those from:

- The Open Data Institute
- The Department for Business, Energy and Industrial Strategy
- OpenNorth
- Open Data Services
- Porism
- NHSx
- IStandUK
- Frontier Economics.

The literature review and the stakeholder interviews explored the input of the ODI to developing and implementing open standards for data, the market failures that these standards address, and the wider social and economic impacts that these standards support.

We collated evidence from the literature and the interviews to build an understanding of the channels through which open standards for data drive social and economic impacts. In particular, we used the evidence to describe:

- the **activities** undertaken by the ODI and other organisations to facilitate the development and adoption of open standards for data;
- the **outputs** or tangible deliverables that are produced by these activities;
- the **outcomes** or intermediate effects that are driven by these outputs; and
- the wider **social and economic impacts** that result from these outcomes.

We then described how these activities, outputs, outcomes and impacts relate to each other using a **logic model**. We tested and iterated the logic model with the aforementioned stakeholders.

Finally, we conducted a workshop with ODI stakeholders to further refine and validate the logic model and ensure that it described the full range of pathways through which open standards for data may deliver social and economic returns.

## 2.2 Case study approach

In order to test the economic framework and provide evidence on the social and economic returns to standards, we conducted two case studies on ODI interventions which have led to the development, improvement or adoption of open standards for data.<sup>17</sup> The case studies aimed to measure the links between activities, the development and adoption of open standards, and the intended outcomes and impacts of the programme. This phase of work had five stages:

1. **Identify** criteria for selecting the case studies
2. **Select** the case studies
3. **Prepare** for the case studies
4. **Conduct** the case studies
5. **Analyse and report** on the case studies

### Identify criteria for selecting case studies

We applied a “purposive sampling” approach to selecting case studies, using judgement to choose case studies based on a set of criteria, rather than aiming to construct a representative sample. We considered a number of criteria when selecting the case studies:

- **Maturity.** Case studies should relate to interventions in the past five years. This will balance our ability to interview knowledgeable stakeholders with ensuring sufficient time has elapsed since the standard was implemented.
- **Adoption.** One case study should focus on an intervention where adoption was mandated by a regulatory framework; the other should focus on an intervention where adoption was voluntary. Different modes of adoption may imply different barriers to data sharing and benefits of standards, and covering each mode will allow these differences to be explored as far as possible.

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<sup>17</sup> An econometric study of firm-level outcomes based on quasi-experimental methods is beyond the scope of this study. Moreover, it is our view that an econometric study would be neither feasible nor robust in this case.

- **ODI role.** Each case study should focus on a different type of intervention or mode of ODI support. This will help us understand the contribution of ODI or third-party support, and how different types of support impact this contribution.
- **Outcome.** The two case studies should relate to interventions that, between them, address all high-level outcomes in the logic model. This will facilitate discussion on the full range of social and economic impacts of standards.

### Select the case studies

We considered a longlist of potential case studies discussed in the literature or the stakeholder engagement process (see Figure 2).

Figure 3 describes how a subset of these standards were assessed against the criteria.

**Figure 2 Longlist of potential open standards for data case studies**

Standard	Description
Open Active	Physical activity data standard
General Transit Feed Specification	Public transport data standard
Open Contracting Partnership	Open contracting data standard
Brownfield land registers data standard	Brownfield site data standard
Ofgem Midata	Customer-level energy data standard
Open Banking	Open banking data standard
Roadworks.org	Roadworks data standard
CSV lint	Comma separated value (CSV) validation tool
Syngenta Good Growth Plan	Agricultural data standard
Porism LGA Dataset	Standardised local government data
Open511	Road event data standard (Canada)
Represent	Local representative data (Canada)
360Giving	Grants data standard
Popolo	Democratic organisation data standard
Surrey Planning Hub	Planning application data standard
UK Food Standards Agency	Food hygiene rating scheme

Source: *Frontier Economics*

**Figure 3 Assessment of potential case studies against criteria**

Standard	Maturity	Adoption	ODI role	Outcomes
Open banking	In progress	Mandatory	Advocacy, guidance	Information, competition, ecosystem
OpenActive	In progress	Voluntary	Delivery	Information, competition
Open Contracting Data Standard	Mature in the UK, in progress in other jurisdictions	Mandatory	Limited involvement	Information
Brownfield Land Registers Data Standard	Mature	Voluntary	Limited involvement	Information, competition
Ofgem Midata	Early stages	Mandatory	Advisory, guidance	Information, competition, ecosystem
General Transit Feed Specification	Mature	Voluntary	Not involved	Information, competition, ecosystem
Roadworks.org	Mature	Voluntary	Not involved	Information, competition, ecosystem

Source: *Frontier Economics*

In consultation with the ODI, we selected the two case studies that we agreed best met the criteria. These were **Open Banking** and **OpenActive**.

### Prepare for the case studies

Once the case studies were selected, we developed a version of the logic model specific to each standard.

We used this logic model to inform a set of testable hypotheses about the outcomes and impact of the standard, and noted how these hypotheses would be tested as part of the case study (stakeholder engagement, literature review, ODI data requests etc.). We also developed a topic guide to provide a high-level structure for interviews.

We identified a range of experts and stakeholders to invite to participate in each case study, ensuring that we collected evidence from a diversity of perspectives including where possible:

- the ODI
- the sponsors of the standard
- organisations involved in developing the standard
- data providers (organisations that hold data)
- data intermediaries (organisations that repackage data)
- data users (individuals and organisations that benefit from data).

Where particular organisations were not willing or able to participate in the engagement process, we selected alternatives who would be able to provide

similar evidence. The organisations that we engaged with for each case study are listed in Figure 4.

**Figure 4 List of organisations engaged by case study**

<b>OpenActive</b>	<b>Open Banking</b>
ODI – implementation managers	ODI – open banking spokesperson
ODI – technical experts	Competition and Markets Authority
Sport England	Open Banking Implementation Entity
GLL	Bacs Payment Schemes Limited
Playfinder	Financial Services Consumer Panel
EDM UK	Barclays plc
Legend	Monzo Bank Ltd
ClubSpark	Account Technologies
	Frontier Economics – Financial Services Practice
	OpenWrks

Source: *Frontier Economics*

### Conduct the case studies

We conducted semi-structured interviews with relevant experts from the respective organisations. Each interview considered:

- the role played by the ODI in developing the standard or encouraging adoption;
- the likely counterfactual in the absence of the ODI intervention;
- the effect of the standard on the outcomes identified in the theory of change;
- the effect of the standard on the long-term impacts identified in the theory of change; and
- any monitoring data or quantitative evidence on outputs, outcomes or impacts.

### Analyse and report on the case studies

Finally, we combined the evidence collected from the semi-structured interviews with available quantitative evidence and any relevant estimates from the literature to:

- develop an assessment of the economic and social returns generated by each standard; and
- assess the components of these returns that could be attributed to the ODI.

## 3 ECONOMIC FRAMEWORK

### KEY TERMS

- **Economic framework:** A logical framework for describing how activities to encourage the development and adoption of open standards for data are converted into outputs, outcomes and impacts.
- **Theory of change:** A particular channel through which activities to encourage the development and adoption of open standards for data are converted into outputs, outcomes and impacts. The Open Standards for Data Logic Model describes three theories of change: information, competition and innovation.
- **Activities:** Actions undertaken by the ODI and other organisations to facilitate the development and adoption of open standards for data.
- **Outputs:** The tangible deliverables that are produced by activities.
- **Outcomes:** The intermediate effects that are driven by outputs.
- **Impacts:** The wider social and economic effects that are driven by outcomes.
- **Data provider:** An organisation that collects, maintains and publishes data, making it available for others to use.
- **Data intermediary:** An organisation that adds value to data and translates it into information and insight for users.
- **Data user:** An individual or end user who benefits from information and insight.

An economic framework sets out the logic for how a policy intervention is expected to generate particular outcomes and impacts. It is considered best practice to have this theory developed from the inception of the evaluation to help objectively develop hypotheses and evaluation questions which can be taken to the evidence.

We followed the approach outlined in Section 2 to develop a logic model describing the social and economic returns to open standards for data and the ODI's contribution to their development and implementation.

The full logic model is presented as Figure 5. The model describes how **activities** including the provision of delivery, advisory, guidance and advocacy support, along with regulation and other external factors, facilitate the development and adoption of open standards (**outputs**). Once adopted, these standards can drive three main types of **outcomes**:

- providing more insight and information to end users;
- lowering the barriers to market entry and increasing competition; and
- supporting an ecosystem of innovative new businesses.

We refer to each group of outcomes, and the impacts that these generate, as a **theory of change**. Each theory of change results in a range of social and economic **impacts**, for example:

- individuals benefit from more, higher-quality products at lower prices;
- organisations are able to produce goods and services more efficiently; and
- end user trust in the sharing of data increases (or decreases), which in turn affects the amount of data sharing.

Ultimately, these impacts can translate into an increase in the gross value added to the economy through increased productivity or consumption.

Importantly, while the logic model captures the social and economic returns associated with open standards for data, it should be considered as part of a larger logical framework related to open, trustworthy ecosystems and institutions, and a robust data infrastructure. These external contextual factors can reinforce or mitigate the effects of open standards for data.

The remainder of this section describes in more detail the activities, outputs, and theories of change relevant to open standards for data.

### 3.1 Activities

The activities undertaken by the ODI and similar organisations to support the development and implementation of open standards for data can be categorised into four main groups: delivery, advisory, guidance and advocacy.

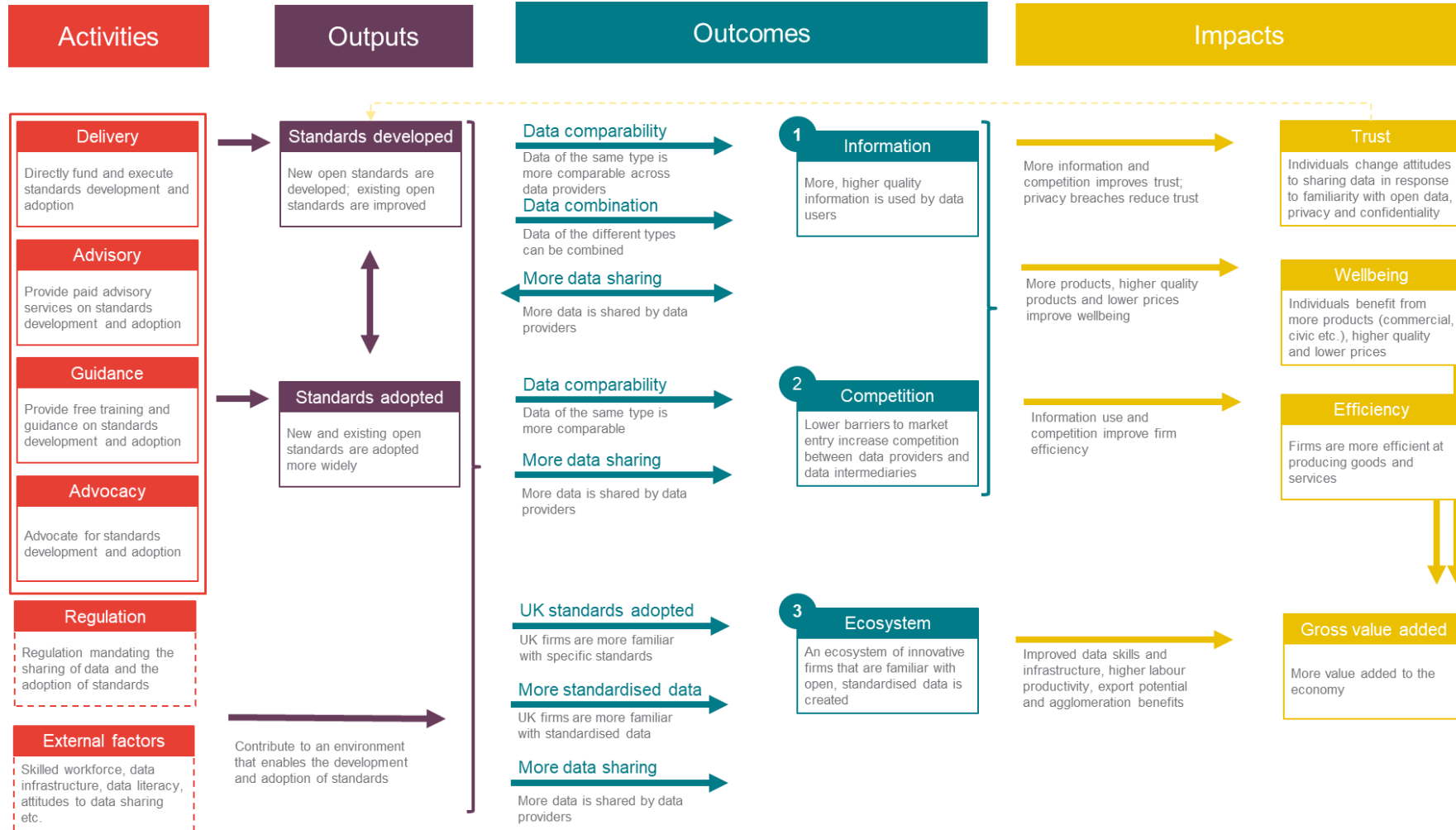
**Delivery:** Directly developing new open standards or improving existing open standards, either using ODI resources or by funding third parties. For example:

- The ODI led the development of CSV Lint, an online validation tool to check consistency of Comma Separated Value (CSV) data against the *CSV on the Web* standard.
- The ODI coordinated the development of the OpenActive standard to enable the sharing of information on physical activity opportunities in the UK and encourage increased levels of physical activity. Acting as stewards of the project, the ODI has built on a previously existing standard, adding in the custom elements specific to the physical activity sector.

**Advisory:** Advising businesses on the development of new open standards, and the adoption of existing, high-quality open standards. For example:

- The ODI advised Syngenta, a biotechnology firm focused on the agriculture sector, on the adoption of existing open standards to support the publication of data created within the Good Growth Plan. The ODI also supported Syngenta in understanding how to adopt, and support the adoption of, other standards and best practices relevant to the agriculture industry.
- The ODI helped the Open Knowledge Foundation drive adoption of the Frictionless Data standards, by advising and supporting the creation of an ecosystem of tools to improve interoperability and quality of open data publishing.

Figure 5 Logic model: the social and economic returns to open standards for data



Source: Frontier Economics analysis



**Guidance:** The ODI guides businesses and public/third sector organisations in the development and adoption of standards. For example:

- The ODI provides a range of freely accessible online tools and paid services to support organisations seeking to create more social and economic value from data. These resources include online courses and the Open Standards for Data Guidebook. Through an open and collaborative approach, it develops these tools to foster the widespread adoption of high-quality data standards.

**Advocacy:** Advocating for open standards development and adoption, and promoting the importance of open standards for the wider community. The ODI acts as an advocate for the adoption of new or existing high-quality standards. As an independent third party and partner to a diverse range of public and private organisations, it advocates for the creation of an open and trustworthy data ecosystem. Through knowledge sharing, it raises awareness of the importance of open standards for data with the wider community.

These activities are augmented by a range of external factors that support or frustrate the implementation and adoption of open standards. These include the availability of a suitably skilled workforce, the necessary data infrastructure, data literacy in the wider population and trustworthy approaches to data access.

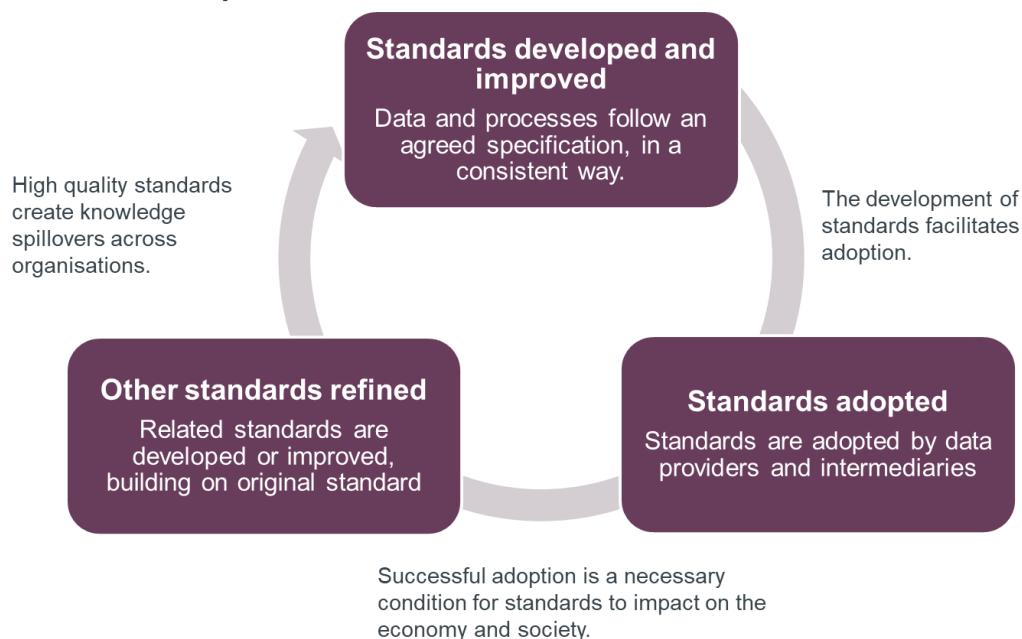
Regulation is also a vital input to the success of standards. Where organisations do not have sufficient incentives to develop or adopt open standards, regulatory intervention may be needed to mandate or incentivise standards development and adoption (e.g. in the contexts of Open Banking or the Midata standard). Importantly, once adoption reaches a “tipping’ point”, data providers might be expected to share user data even in the absence of regulation. Where these incentives already exist, regulation may be less relevant.

## 3.2 Outputs

The combination of activities, regulation and other external factors drives the development and adoption of new standards. Figure 6 describes this as an iterative process:

- Standards development activities facilitate the development of new open standards, or the improvement of existing standards.
- The development of a robust standard facilitates the adoption of the standard, a necessary condition for the standard to drive social and economic impacts.
- The adoption of the standard is a necessary condition for the standards development process to drive social and economic returns. In the absence of adoption, the standard will not have an impact.
- The adoption of one standard also has spillovers to other sectors and contexts, serving as the building block for the development of related standards. For example, defining a typology of road incidents as part of the Roadworks.org standard could be leveraged to refine public transport planning standards.

**Figure 6** The iterative process of data standards development and adoption



Source: Frontier Economics analysis of stakeholder evidence

### 3.3 Information theory of change

The first theory of change relates to the role of open standards in increasing the amount of insight and information available to end users.

Because of standards adoption, existing data is more easily compared and combined, and new data is shared. As a result, more insight and information are available to end users. This information is of a higher quality and is more up to date. For example:

- Because of the adoption of the OpenActive standard, individuals have more correct, up-to-date access to information about physical activity opportunities.
- Because of the adoption of the Open Contracting standard, service providers can review a wider range of commercial opportunities more quickly and efficiently.

#### Hypothesised outcomes

There are three main channels through which standards adoption leads to more insight and information: data consistency, data combination and more data sharing.

**Data consistency:** Due to data standardisation, the same type of data is made more consistent across data providers. Hence, information is more comparable, and more insight can be drawn from it. For example:

- Because of the brownfield land registers data standard, developers are able to compare key planning information across a wide range of potential brownfield sites.

- Because of data standardisation by Yelp, individuals can compare restaurants on the basis of their municipal health inspection results.

**Data combination:** Data standards allow for different types of data to be combined in a single platform, generating greater value for data users. For example:

- Because of the Midata energy standard, platforms can combine an individual's energy consumption data with their financial transaction data, making it possible to build services that can help users understand their usage.
- Because of the standardisation of date/time formats, two different datasets can be merged without having to manually change their time formats.

**More data sharing:** As a result of the lower costs and higher benefits of data sharing, more data is shared by data providers, leading to more insight and information being available to end users. The process is iterative: as more data is shared and used in ways that benefit users, the benefits of sharing data increase, encouraging further adoption and sharing. For example:

- Because of Roadworks.com, a platform that allows users to access roadworks data, the returns sharing road data are higher (more individuals will benefit from them) and local authorities might be more willing to incur the costs of sharing this data.

### Hypothesised impacts

Increased availability of insight and information can drive social and economic impacts.

Because the distribution of these benefits between businesses and individuals will depend on a range of contextual factors, we do not make specific hypotheses on this allocation. Rather, we consider the potential social and economic benefits to individuals (referred to here as wellbeing) and the potential benefits to businesses (referred to here as efficiency), and we acknowledge that standards might lead to one or both of these types of benefits.

**Wellbeing:** More insight and information can mean individuals benefit from a greater variety and quality of products, at lower prices, as well as social benefits like greater civic engagement and social inclusion. For example:

- Because of the General Transit Feed Specification standard, there are a wide range of services supporting different needs so that different types of commuters are able to make better travel decisions with less stress and preparation and reach their destination more quickly.
- Because of the Represent standard, Canadian voters are more aware of their local, state and federal representatives, and more engaged with the democratic process; increasing social and democratic inclusion.

**Efficiency:** The increased availability of insight and information, and better compatibility with existing information, helps firms become more efficient at producing more tailored goods and services, increasing wages and profits.<sup>18</sup> For example:

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<sup>18</sup> Nesta (2019), 'Inside the Datavores: Technical Report', Retrieved from <https://www.nesta.org.uk/report/inside-the-datavores-technical-report/>

- Because of the Open Contracting standard, service providers can make more informed choices about the projects they bid for, reducing time spent drafting proposals and increasing their productivity on projects they win.
- Because of trustworthy access to user data provided by the Open Banking standard, third parties can offer users tailored financial services products, potentially increasing employment and wages.<sup>19</sup>

**Trust:** Standards can increase trust directly by embedding measures to promote trustworthy behaviour and mitigating misuse. The increased sharing of data can also increase individuals' familiarity with data sharing, affecting their trust that data will be collected, used and shared in trustworthy ways. However, open standards for data are not necessarily a sufficient condition for changes in trust, which also depend on a range of wider conditions (regulation, consumer protection, etc). Importantly, more (or less) trust can have feedback effects, further increasing (or decreasing) data sharing and the adoption of standards. For example:

- In the context of Open Banking, processes to authorise trusted third-party providers help build user trust in sharing data.
- If data is misused in ways that cause harm, trust and the willingness of organisations and individuals to share information are likely to be reduced.

### 3.4 Competition theory of change

The second theory of change relates to the role of open standards in lowering barriers to market entry and increasing competition between data providers (organisations that hold the data) and between data intermediaries (organisations that transform the data to make it useful).

Competition effects are most likely in sectors where a small number of large firms hold valuable user data that is not readily portable (e.g. banking, online retail, social networks etc.). When coupled with required regulation, open standards for data can make it harder for these firms to hoard data and easier for new firms to enter and compete.

#### Hypothesised outcomes

There are two main channels through which standards adoption leads to increased competition: data consistency and more data sharing.

**Data consistency:** Because information is more comparable, users can more readily compare data across firms (either directly or via data intermediaries), meaning that existing firms are less able to exploit proprietary user data. For example:

- Because of the standardisation of energy consumption data (being facilitated by the Midata standard), users can compare tariffs, driving transparent competition between energy providers.

**More data sharing:** More trustworthy, high-quality data provides other organisations with the resources to develop new products and compete with

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<sup>19</sup> Reynolds, F., and Chidley, M., (2019), 'Consumer Priorities for Open Banking', Retrieved from [https://www.ofgem.gov.uk/system/files/docs/2017/10/state\\_of\\_the\\_market\\_report\\_2017\\_web\\_1.pdf](https://www.ofgem.gov.uk/system/files/docs/2017/10/state_of_the_market_report_2017_web_1.pdf)

incumbents (and with each other), and to facilitate an increase in competition. For example:

- Because of the Open Banking standard, more data sharing in the banking sector creates the opportunity for a new set of firms to offer financial services aggregation products that allow users to access all of their current account data through a single application, increasing competition in the sector.

### Hypothesised impacts

Increased competition can drive social and economic impacts, notably trust, wellbeing and efficiency.

**Trust:** Users may be more likely to trust that their data is not being abused when it is not hoarded by a small number of large companies. However, users may also be less willing to share data with a wide range of small, inexperienced firms. These effects depend heavily on the wider context, including regulation and consumer protection. For example:

- Users may remain wary of personal minute-by-minute energy use data being shared with a range of intermediaries under the Midata energy standard. Regulators therefore have set a high bar for accessing this data.

**Wellbeing:** Reducing market power means that firms are forced to take advantage of their dominant position. Prices are lower and the range and quality of products are higher. For example:

- More sharing of comparable user data in the retail banking sector through the Open Banking standard could be expected to lead to lower prices for savings and borrowing products.

**Efficiency:** Reducing market power means that firms will be forced to become more efficient, using the data that they hold and competing with innovative new entrants. For example:

- New entrants in the lending market, facilitated by the Open Banking standard, could be expected to force incumbent retail banks to improve their approach to predicting default risk for user lending.

## 3.5 Ecosystem theory of change

The third theory of change relates to the role of open standards in facilitating the development of a self-perpetuating ecosystem of innovative firms that are familiar with standardised data.

Unlike the information and competition theories of change, which primarily benefit the organisations and individuals involved, this theory of change captures effects which benefit local and national economies in the aggregate.

### Hypothesised outcomes

There are three main channels through which standards adoption leads to increased innovation: adoption of local standards, the availability of more standardised data and more data sharing.

**More standardised data available:** The proliferation of standards will ensure that local firms have experience developing new, innovative products in a standardised data environment. This will give them a head-start in providing similar products in other jurisdictions that adopt open standards for data. For example:

- Legend Club Management Systems, one of the system providers using the OpenActive standard, launched its Canadian subsidiary in 2016 and is well placed to exploit potential standardisation of leisure data in Canada.

**Adoption of local standards:** Leading in the development of open standards for data increases the likelihood that local standards are adopted by other jurisdictions. This will enhance the head-start enjoyed by local firms familiar with these specific standards. For example:

- The Open Banking Working Group developed standards to facilitate the implementation of PSD2 in the UK. If similar standards are adopted by other European countries, UK financial technology firms will have an “open banking head start”.

**More data sharing:** Regardless of standardisation, more sharing of data also helps to incubate local firms in a range of sectors. For example:

- Access to Transport for London (TfL) timetable, disruption and service status data is estimated to have helped third party app developers contribute approximately £15 million per year and approximately 500 jobs to the London economy.<sup>20</sup>

### Hypothesised impacts

Existing firms and start-ups that work with standardised data to develop new and innovative products add value to the economy by:

- generating more productive jobs;
- building skills that might spill over into other sectors of the economy; and
- potentially exporting goods or services.

For example:

- City mapper, founded in London in 2017 using TfL’s data, supports high-productivity jobs in the UK and now exports its product to 40 cities internationally.

Increased gross value added is also driven by increased wellbeing and efficiency resulting from the information and competition theories of change:

- Increased wellbeing increases the amount of consumption of goods and services.
- Increased efficiency raises the productivity of firms, the wages of workers and the returns to investors.

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<sup>20</sup> Deloitte (2017), ‘Assessing the Value of TfL’s Open Data and Digital Partnerships’, Retrieved from <http://content.tfl.gov.uk/deloitte-report-tfl-open-data.pdf>

## 4 CASE STUDY 1: OPENACTIVE

### KEY TERMS

- **Activity providers (OpenActive):** Those organisations that provide or facilitate physical activity opportunities for individuals, including leisure centres, class instructors, venue owners etc.
- **Activity finders (OpenActive):** Those organisations that help individuals to identify and/or book physical activities.
- **Opportunities (OpenActive):** Instances of physical activity sessions.
- **Users:** Individuals or organisations that are the end users and ultimate beneficiaries of open data standards.

### 4.1 Intervention context

The OpenActive Opportunity Standard (hereafter, the standard) was developed as part of a the wider OpenActive initiative.

The OpenActive initiative was developed voluntarily by organisations and engaged individuals working within the physical activity sector, stewarded by the ODI and Sport England.

OpenActive’s primary goal is to address physical inactivity: one of Britain’s biggest public health challenges. Together with national campaigns like This Girl Can and Change4Life, OpenActive aims to address the behavioural and practical barriers individuals face when trying to find physical activities near them.<sup>21</sup> It achieves this by collaborating with physical activity providers to publish openly available data on where and when physical activity opportunities occur – *open opportunities data*. This allows third parties in the physical activity sector to develop products to help individuals “find the right physical activities for them”, ultimately driving a range of benefits including improved health and social connectedness, increased productivity and reduced healthcare costs.<sup>22</sup>

To enable the publishing of open opportunities data, the ODI and the OpenActive community developed an open standard to facilitate the consistent sharing of physical activity data.<sup>23</sup> The standard’s goal is to facilitate the opening-up of data by:

- establishing a standardised format in which the data should be published; and
- improving access and interoperability of data across the sector.<sup>24</sup>

Through the standard, activity providers (e.g. leisure centres) open up opportunities data to be re-purposed by activity finders (services and online

<sup>21</sup> ‘About OpenActive’, Retrieved from <https://www.openactive.io/about-openactive/>

<sup>22</sup> Ibid.

<sup>23</sup> Dodds, L., (2017), ‘Progress Update on the OpenActive Standards Work’, Retrieved from <https://blog.openactive.io/progress-update-on-the-openactive-standards-work-958eee90daa6>

<sup>24</sup> ‘OpenActive Community Group’, Retrieved from <https://www.w3.org/community/openactive/>

platforms helping users find activities).<sup>25</sup> Activity providers and activity finders can be either commercial or non-commercial in nature. The sharing of open opportunities is sometimes intermediated by system providers (e.g. Gladstone, Legend).

To increase consistency in how physical activity data is published, the standard determines a set of rules to:<sup>26</sup>

- describe physical activity opportunities, by defining different physical activities opportunities consistently – for example, a standard way to describe that a Pilates class takes place at a local leisure centre every Tuesday;
- publish activity lists describing the ways in which individuals can be physically active – for example, showing that Judo and Karate are both types of Martial Arts; and
- define the format in which data should be shared to enable booking of events and facilities – for example, via standardised open Application Programming Interfaces (APIs).

The standard is a key component of the OpenActive initiative. Without a common way to describe physical activities and related events, it is expected that “developers will struggle to combine data from multiple sources to help users discover the opportunities that are available to them”.<sup>27</sup>

## 4.2 Economic framework

We developed an economic framework specific to the OpenActive context, which translates our underlying theories of change into a set of specific hypotheses describing the micro-economic channels through which the standard leads to wider benefits for individuals, organisations and the UK economy. An OpenActive specific logic model is provided in ANNEX A.

The following paragraphs set out the hypothesised effects of the standard in terms of its direct outputs, outcomes and impacts. Outcomes are grouped by theory of change for convenience. Section 4.3 proceeds to test these hypotheses, where possible, against evidence collected during the case study.

### Hypothesised outputs

- **Standards are adopted and opportunities are published.** As a result of the clear specifications and guidelines set out in the OpenActive standard, as well as the stewardship of the ODI and Sport England, a number of activity providers voluntarily adopt the standard and publish open opportunities data on a range of physical activities. Because more open opportunities data is available, more innovators in the physical activity sector (e.g. activity finders) develop products to help users find activities.

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<sup>25</sup> Also referred to as “data users” in ODI’s terminology.

<sup>26</sup> Ibid.

<sup>27</sup> Dodds, L., (2017), ‘Progress Update on the OpenActive Standards Work’, Retrieved from <https://blog.openactive.io/progress-update-on-the-openactive-standards-work-958eee90daa6>



### Hypothesised outcomes (information)

- **New and more targeted opportunities reach individuals.** By reducing the cost and increasing the benefits associated with publishing and sharing open opportunities, the volume of standardised data published by activity providers and shared by activity finders increases. This leads to an increase in the number of opportunities easily accessible to individuals and the number of individuals accessing these opportunities. As opportunities data is shared by a range of activity providers and tailored to a diverse range of individuals, the opportunities individuals see are better targeted to their needs.
- **Increase in the hours of physical activity.** As a result of new and existing opportunities reaching more individuals, there are increases in the number of hours of physical activity conducted and the number of individuals who are physically active; benefiting individuals and organisations in the physical activity sector.

### Hypothesised outcomes (competition)

- **Increase in competition between activity providers and between activity finders.<sup>28</sup>** By enabling the publishing of more opportunities data, the standard increases competition between activity providers, giving individuals more choice and increasing the visibility of smaller providers. As the standard can be openly adopted by all activity finders, the risk of a small number of organisations gaining market power is reduced.
- **Reduction in costs for activity providers and users.** Because the standard is open, activity providers can publish data without bearing the cost of developing a standard internally. As a result of opportunities data reaching individuals through targeted activity finders, activity providers can reduce marketing, scheduling and booking costs.
- **Increase in the hours of physical activity.** Reduced costs and increased competition leads to reduced costs for users. This drives an increase in the number of hours of physical activity conducted, and the number of individuals who are physically active.

### Hypothesised impacts

- **Health and wellbeing impacts.** Because of increased levels of physical activity, the standard leads to an increase in overall population health and social connectedness.
- **Distributional and social benefits.** As the standard enables opportunities to be shared with a diverse range of individuals, it has greater impact on the level of physical activity conducted by the least active/most vulnerable groups within the population. This is likely to have positive effects on the distribution of physical activity and associated benefits across different socio-economic groups.
- **Economic impacts.** The increase in overall physical activity generated by the standard, through greater overall population health and wellbeing, leads to

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<sup>28</sup> Activity providers are those businesses that provide or facilitate physical activity opportunities for individuals, including leisure centres, class instructors, venue owners etc. Activity finders are those businesses that help individuals to identify and/or book physical activities.

sizeable public health cost savings and greater economic productivity (e.g. by a reduction in work absenteeism).

### 4.3 Findings

This section summarises the evidence collected as part of the case study process.

The case study allowed us to test many of the hypotheses identified in the logic model. It provided mostly qualitative insights into the perceived impacts of the standard, and the channels that are considered to be most important in driving these impacts. This was augmented with monitoring data on the development and adoption of the standard, and an empirical example demonstrating the link between the standard and wider impacts under a set of realistic assumptions.

The evidence presented is not directly attributed to the individual stakeholders to avoid disclosing sensitive information.

In testing these hypotheses, we evaluated the impact of the standard by comparing the current OpenActive ecosystem to two counterfactual scenarios (hypothetical worlds in which OpenActive did not exist):

- **Data wasteland:** In the absence of the standard, opportunities data may be shared in a non-standardised way using bilateral agreements, or may not be shared at all. Many activity providers still rely on their own websites, social media pages or printed flyers to provide information on opportunities.<sup>29</sup> Individuals do not benefit from any substantive increase in information and there is no increase in physical activity.
- **Data oilfield:** In the absence of the standard, a handful of well-funded data intermediaries establish themselves as two-sided platforms: collecting data from activity providers, standardising it manually and offering information to users in exchange for a booking fee or similar. Individuals benefit from the increase in information and competition between activity providers is increased. However, the market power of these intermediaries means that they are in a position to extract *rents* from activity providers and users. Higher activity costs, along with the fact that platforms are less likely to target vulnerable population groups, limit increases in physical activity.

Evaluating the impact of the standard against these counterfactual scenarios allows us to present upper- and lower-bound estimates of the effect of the standard. The difference between the current situation and the *data wasteland* counterfactual generally provides an indication of the upper-bound of the effect of open standards: without the standard, it is likely that less information would be available to individuals. Likewise, the difference between the current situation and the *data oilfield* counterfactual provides an indication of the lower-bound of the effect of open standards: without the standard, information may still be available to users, but it would be flawed in a number of important ways.

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<sup>29</sup> Open Data Institute, (2018), 'OpenActive: Using Open Data to Help People Get Active'.

## 4.3.1 Outputs

### KEY MESSAGES

- The OpenActive standard has been adopted by 19 activity providers, leading to the publication of new opportunities.
- The number of opportunities published through the standard in the UK has increased to 200,000 per month since the OpenActive launch, and is forecast to grow further, suggesting that the standard has enabled more opportunities to be shared than would have occurred in the *data wasteland* counterfactual scenario.

#### Activity providers have voluntarily adopted the OpenActive standard and published open opportunities datasets

A number of organisations in the physical activity sector began voluntarily publishing their opportunities data through the standard after the OpenActive initiative was launched.

Since November 2016, **93 organisations** have registered as community members associated with the initiative. This includes activity providers and activity finders.<sup>30</sup>

**Nineteen activity providers and 10 activity finders publish and use** open opportunity datasets through the standard, covering a total of **526 physical activity types**.<sup>31</sup> These datasets display descriptions of the activity, their time, their location and a range of related data (clubs, courses, membership requirements, skill level, cost etc.).<sup>32</sup>

This information is standardised and made consistent across activity providers because of the adoption of an agreed standard covering:

- the vocabulary used to describe activities, events, locations etc., and
- the technical specification allowing real-time synchronisation of data between systems.

Stakeholders suggested that the standard was adopted voluntarily by such a large number of organisations due to its openness and easy accessibility, which allowed members to actively contribute to the standard's development. This process created a forum for discussion; refining the standard and boosting its adoption through a positive feedback loop.

#### The number of opportunities published through the standard each month has increased since the OpenActive launch

Monitoring evidence suggests that the number of opportunities published through the standard has increased steadily since the launch of the OpenActive initiative.

<sup>30</sup> Open Data Institute, (2018), 'OpenActive: Using Open Data to Help People Get Active'.

<sup>31</sup> OpenActive, 'Opportunity Data Dashboard', Retrieved from <https://status.openactive.io/>

<sup>32</sup> OpenActive, 'Modelling Opportunity Data 2.0', Retrieved from <https://www.openactive.io/modelling-opportunity-data/> and 'Realtime Paged Data Exchange 1.0', Retrieved from <https://www.openactive.io/realtime-paged-data-exchange/>

Figure 7 describes the increase in the number of opportunities published through the standard each month.

Approximately 200,000 opportunities were published in June 2019, and this is expected to increase to 300,000 by November 2019.

**Figure 7** Number of opportunities published per month



Source: OpenActive monitoring data

All stakeholders suggested that the standard removed frictions in publishing and re-using data to inform users about opportunities. It is therefore likely that the standard has enabled more opportunities to be published than would otherwise have been expected, particularly in a *data wasteland* scenario where a lower volume of non-standardised data would be shared by activity providers.

### 4.3.2 Information theory of change

#### KEY MESSAGES

- The standard facilitates greater visibility of physical activity opportunities, increasing individuals' understanding of the range of available opportunities.
- The standard increases overall levels of physical activity, with the greatest effects being experienced by the least active portion of the UK population.
- Increased physical activity improves population health and wellbeing, and benefits the UK economy through productivity increases and health cost savings.

#### The standard facilitates greater visibility of physical activity opportunities, increasing individuals' understanding of the range of available opportunities

There is evidence that the standard has led to an increase in the number of opportunities reaching users **compared to what would have been expected in the *data wasteland* counterfactual** where individuals considering getting active

face higher search costs. This is because the standard reduces frictions in data publishing faced by activity providers and makes it easier for activity finders to combine datasets and share opportunities. The change in reach is estimated empirically as part of the example in this section.

One stakeholder noted that, prior to OpenActive, it was difficult for individuals to understand the full range of physical activity opportunities available in their local area. They added that, even where online information was available, it was often not well presented on providers' websites. Another stakeholder noted that the standard enabled a better online experience for users searching for opportunities and increased their understanding of the range of physical activities available to them.

In addition to facilitating greater visibility of opportunities in general, the standard enables these opportunities to reach individuals who would not previously have been aware of them.

Evidence from one stakeholder suggested that up to 40% of the opportunities seen by an average user were likely to contain new information (information about an opportunity that they would otherwise not have been aware of). Of the remaining opportunities, 20% were likely to contain *better* information (presented in a more understandable format) and 40% were likely to contain information that the individual already had.

There is evidence that the standard enables opportunities data to reach individuals who would not otherwise be exposed to the same information, **compared to what would have been expected in the *data oilfield* counterfactual**. In a *data oilfield* counterfactual, it is likely that a few established commercial activity finders would target their services to the most profitable users: those who are already active or likely to be active. Instead, by lowering fixed costs and enabling a wide range of non-commercial activity finders to offer a user experience tailored to diverse needs and experiences, the standard ensures opportunities to reach those individuals who may be less likely to be physically active: typically the elderly, children, the disabled, and ethnic minorities.<sup>33</sup>

### **The standard increases overall levels of physical activity, by increasing the reach of information and removing practical barriers to getting active**

Case study evidence suggests that the standard, and the increased visibility of opportunities, contribute to an increase in the amount of physical activity performed by individuals. The lack of readily available information is one of the primary practical barriers to individuals getting active: if individuals are unable to find activities quickly and simply they are less likely to exercise. Indeed, evidence from the literature shows that individuals searching for an activity are likely to “book the sessions found within 4 seconds of searching or not book at all, rather than spending longer to find something more suitable”.<sup>34</sup>

<sup>33</sup> Department of Health (2019), 'UK Chief Medical Officers' Physical Activity Guidelines', Retrieved from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf)

<sup>34</sup> OpenActive (2017), 'Our Parks Case Study', Retrieved from [https://www.openactive.io/case\\_studies/our-parks.html](https://www.openactive.io/case_studies/our-parks.html)

Stakeholders argued that the standard has led users to book more physical activity sessions. An activity finder we interviewed reported that activity providers experienced up to a 26% uplift in its venue utilisation after listing on its platform through OpenActive. This effect is particularly strong for smaller providers who may lack the resources to market their activity offering effectively.

The impact of the standard is likely to be lower where provider capacity is constrained (i.e. during peak time slots). However, two stakeholders noted that the standard helped even out demand between peak and off-peak times, increasing the overall level of physical activity.

While it is plausible that this uplift resulted from individuals switching between venues or activities, stakeholders suggested that an increase in physical activity due to the standard is most likely subject to low “cannibalisation” rates. They suggested that individuals do not regularly switch between different types of physical activities (e.g. between tennis and squash), and generally only consider activity providers in a narrow geographic area. This implies that an individual that starts a new activity because of the standard is unlikely to be substituting this for an existing activity.

Therefore, there is evidence to support the hypothesis that the standard leads to an overall increase in the level of physical activity.

Moreover, there is evidence that this increase in physical activity is likely to be skewed towards less active individuals. One stakeholder noted that, by enabling non-commercial activity finders to target certain demographics (e.g. Change4Life), the standard is particularly effective at increasing physical activity for less active socio-demographic groups. According to the stakeholder, this is particularly relevant when compared to a *data oilfield* counterfactual scenario in which information would likely be intermediated by a few one-size-fits-all activity finders rather than tailored to diverse needs.

### **Increased physical activity has positive effects on population health and wellbeing**

There is extensive research into the health and wellbeing benefits of physical exercise, some of which we set out below. By providing users with multiple solutions to increase their awareness of activity opportunities and boosting physical activity levels, the standard contributes to reducing physical inactivity in the UK.

Sport England estimates that almost 18 million (39.4%) adults in the UK do not achieve the 150+ minutes of physical activity per week that the Chief Medical Officer believes is required to maintain sustained levels of health and wellbeing.<sup>35</sup> Physical inactivity differs by demographic. Inactivity is higher for women, older individuals, those in low income households and black or minority ethnic groups.<sup>36</sup>

Sport England points to ample evidence showing how regular physical activity can reduce the risk of many chronic conditions, including “coronary heart disease, stroke, type 2 diabetes, cancer, obesity, mental health problems and

<sup>35</sup> Sport England (2018), ‘Active Lives Survey’, Retrieved from <https://www.sportengland.org/research/active-lives-survey/>

<sup>36</sup> Department of Health (2019), ‘UK Chief Medical Officers’ Physical Activity Guidelines’, Retrieved from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf)

musculoskeletal conditions”.<sup>37</sup> Further, an increase in physical activity has been proven to reduce anxiety, depression and psychological distress,<sup>38</sup> and is effective in improving mood, physical self-perception and self-esteem.<sup>39</sup>

Research shows that physical inactivity causes an estimated **37,000 premature deaths** per year.<sup>40</sup> This imposes a substantial cost, estimated at **£1.06 billion per year**, on the National Health Service for the treatment of “long-term conditions and associated acute events such as heart attacks, strokes, falls and fractures”. In addition, the costs of lost productivity have been estimated at **£6.5 billion per year**, £5.5 billion from absences and £1 billion from the premature death of working-age adults.<sup>41</sup>

By removing practical barriers to activity, particularly for vulnerable groups, the standard contributes to unlocking positive health and wellbeing impacts for the UK population, complementing related campaigns like Change4Life and This Girl Can which address the behavioural barriers to physical inactivity.<sup>42</sup> The following empirical example provides an estimate of the approximate scale of these impacts under a set of realistic assumptions.

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<sup>37</sup> Sport England, 'Health and Benefits of Sport', Retrieved from <https://www.sportengland.org/research/benefits-of-sport/health-and-benefits-of-sport/>

<sup>38</sup> Scully, D., Kremer, J., Meade, M. M., Graham, R., and Dudgeon, K., (1998), 'Physical Exercise and Psychological Well Being: A Critical Review', *British Journal of sports medicine*, 32(2), 111-120.

<sup>39</sup> Fox, K. R., (1999), 'The Influence of Physical Activity on Mental Well-Being', *Public Health Nutrition*, 2(3a), 411-418.

<sup>40</sup> Open Data Institute, (2018), 'OpenActive: Using Open Data to Help People Get Active'.

<sup>41</sup> Department of Health (2019), 'UK Chief Medical Officers' Physical Activity Guidelines', Retrieved from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf)

<sup>42</sup> Open Data Institute, (2018), 'OpenActive: Using Open Data to Help People Get Active'.

## EXAMPLE: IMPACT ON PHYSICAL ACTIVITY

The quantitative evidence collected in the case study allows us to estimate the number of new activities generated by the OpenActive standard, using two complementary approaches.

### Outcomes: Approach 1

- Up to 200,000 additional opportunities are published each month because of the standard.<sup>43</sup>
- Knowing that publication increases opportunity utilisation by 10-25%,<sup>44</sup> and assuming that there are 10 participants per opportunity in the absence of the standard, the standard leads to an increase of 1 to 2.5 participants per opportunity.
- This leads to an estimated:
  - $200,000 \times 1-2.5 = \mathbf{200,000 \text{ to } 500,000 \text{ new activities}}$  per month because of the standard.

### Outcomes: Approach 2

- Up to 200,000 additional opportunities are published each month because of the standard,<sup>45</sup> and an average of 63 individuals see each opportunity.<sup>46</sup>
- 40% of opportunities seen by an individual are *new*.<sup>47</sup>
- 3-8% of new opportunities viewed lead to bookings (conversion rate).<sup>48</sup>
- This leads to an estimated:
  - $200,000 \times 63 = 12.6 \text{ million}$  individuals viewing opportunities each month
  - $12.6 \text{ million} \times 40\% = 5 \text{ million}$  individuals viewing *new* opportunities each month
  - $5 \text{ million} \times 3-8\% = \mathbf{150,000 \text{ to } 400,000 \text{ new activities}}$  per month because of the standard.

These different approaches suggest a similar increase in the amount of physical activity, equivalent to **150,000 to 500,000 new activities per month**.

### Impacts

Assuming that the average user of these new activities participates in one activity per week, this implies that 35,000 to 115,000 individuals increase their level of physical activity because of the standard.

If half of these individuals move from being inactive to active (according to Chief Medical Officer guidelines), this is equivalent to **17,000 to 58,000 newly active individuals**, 0.1% to 0.3% of the inactive population. This implies that, given these assumptions, the scale of health and wellbeing impacts might be approximately:

- up to **100 premature deaths avoided** per year
- up to **£3 million per year in health costs avoided**
- up to **a £20 million per year increase in productivity**.



### 4.3.3 Competition theory of change

#### KEY MESSAGES

- Evidence suggests the standard impacts competition primarily between activity finders, with limited impacts at the activity provider level.
- The standard reduces the risk of market power in the activity finder market by allowing multiple activity finders to share activity opportunities with individuals, reducing the risk of users facing increases in price or reductions in quality.
- Case study evidence suggests the standard reduces marketing and development costs for both activity providers and activity finders.

#### The OpenActive standard is unlikely to increase competition between activity providers

Activity providers, activity finders and OpenActive sponsors participating in the case study described the nature of competition between activity providers as “highly local”: users tend to choose their preferred venue based on location, and there is a limited amount of user switching between activities or between venues. Moreover, one stakeholder confirmed that prices for many activity providers, particularly leisure trusts, are set by local authorities rather than by market forces.

Therefore, while there is some evidence that the standard increases choice for users, this is unlikely to lead to downward pressure on prices charged to users.

One stakeholder noted that, even if there was not a standard, it is unlikely that activity providers would be able to raise prices for users. While another stakeholder suggested the standard might help smaller providers to advertise their classes more effectively, at this stage there is limited evidence that this allows them to be better placed to compete on a level playing field with larger providers.<sup>49</sup>

#### The standard reduces risk of market power in the activity finder market, preventing users from being harmed in the long run

We tested whether the standard increases competition between activity finders, compared to what would be expected in a *data oilfield* counterfactual in which a few well-funded activity finders position themselves as dominant players.

Activity finders who aggregate and share opportunity data with users have a range of objectives and business models:

<sup>43</sup> ODI figures, updated to June 2019.

<sup>44</sup> Playfinder, an activity finder who participated in the case study, reported an 10-25% average increase in overall sessions' slot utilisation, depending on the booking service used.

<sup>45</sup> ODI figures, updated to June 2019.

<sup>46</sup> One OpenActive-based activity finder, since its launch in 2016, has enabled around 8,000 activity providers to publish opportunities through their platform, and registered around 500,000 unique website views. In performing the calculations, we assume each activity provider publishes one opportunity.

<sup>47</sup> Estimates provided by an activity provider.

<sup>48</sup> Playfinder, an activity finder the participated in the case study, reported that 7% of viewed opportunities lead to actual booking on its platform when automated booking was enabled. We used a range of 3-8% to reflect uncertainty and the fact that non-automatic booking approaches are likely to have lower conversion rates.

<sup>49</sup> As was witnessed by activity finders who participated in the case study.

- **Commercial activity finders** operate either on a subscription-based model (ClassPass, GymPass, MoveGB), or on a pay-as-you-go facility or class booking model (Playfinder/Mylocalpitch, GoSweat).
- **Non-commercial activity finders**, including national campaigns like This Girl Can, Change4Life, Parasport and Age UK, are focused on increasing participation in physical activity rather than generating commercial revenues on their services.

Given that the standard is designed to be openly and easily accessible by all activity finders,<sup>50</sup> it necessarily lowers barriers to entry and minimises the risk that a few activity finders consolidate a dominant position in the intermediary market by collecting data from providers, standardising it manually, and offering information to users.

This was confirmed by evidence from the case study. One stakeholder observed that, in the absence of the standard, such intermediaries could “squeeze activity providers”, leading them to increase prices and reduce the range and the quality of activities offered to users.

### **The standard reduces marketing and development costs for both activity providers and activity finders**

In addition to the competition impacts, all stakeholders agreed that the standard leads to significant reductions in marketing, scheduling and booking costs for both activity providers and activity finders.

One activity provider noted that the standard reduced its administration costs associated with writing the technical documentation required to share opportunities data, saving several months of work for a team of four staff.

Likewise, one activity finder reported that the standard “reduces delays and frictions in signing agreements with activity providers”, as well as decreasing the time taken to integrate new activities from 28 days to 2 days. Another activity finder noted that the development of their recently launched class search functionality would not have happened as quickly in the absence of the standard.

We tested whether the above channels would lead to reduced prices for users taking part in physical activity. While there was limited evidence on the pass-through of cost savings, reduced costs for activity providers and finders should theoretically benefit users in the form of more, higher-quality sessions at lower prices compared to the counterfactuals.

#### **4.3.4 ODI contribution**

The ODI delivered the standard as part of the OpenActive community. It designed and developed the standard and stewarded the OpenActive initiative as a whole. The ODI, Sport England and partner organisations also advocated for standards adoption in the wider community and helped organisations adopt the standard.

As such, it is reasonable to conclude that in the absence of the ODI, the standard may not have been developed. Even if the standard had been developed, the absence of the ODI may have meant that it:

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<sup>50</sup> As confirmed by OpenActive experts at the Open Data Institute.

- was not implemented as soon;
- was not adopted by as many organisations; or
- was not as effective at facilitating insight or competition.<sup>51</sup>

Indeed, two stakeholders noted that facilitating a collaborative approach to standards development both improves the robustness of the standard and encourages adoption in this context.

Therefore, a large share of the outcomes and impacts associated with the standard could be attributed to the activities of the ODI.

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<sup>51</sup> Other organisations had previously attempted to develop a physical activity standard but had not been successful in encouraging adoption.

## 5 CASE STUDY 2: OPEN BANKING

### KEY TERMS

- **Open API:** A free-to-use, publicly available application programming interface (API) that provides developers with programmatic access to a proprietary software application.
- **API call:** A communication process to transfer a user's personal data from the data provider (usually a bank) to a third-party provider (TPP), subject to user consent.
- **CMA 9:** The nine largest banks and building societies in the UK, based on volume of personal and business current accounts.
- **TPP:** Third party providers are organisations that use APIs developed to standards to access users' accounts, in order to provide account information services and/or to initiate payments.

### 5.1 Intervention context

The Open Banking Data Standard (hereafter, the standard) was developed as part of a wider regulatory framework aimed at facilitating greater competition and market transparency in the retail banking industry.

Under the CMA's Retail Banking Market Investigation Order 2017, the nine largest banks in the UK (the CMA 9 or *regulated* banks) were obliged to grant users the right to share current account data with authorised third-party providers (TPPs) using standardised vocabularies, formats, technical specifications and processes. This regulation was imposed as a remedy to address low levels of competition in the retail banking market.

Each bank that adopts the standard facilitates data access through standardised API specifications, including:<sup>52</sup>

- openly available information such as ATM and branch locations;
- information on the price and terms of a range of financial products such as business current accounts, business loans products and commercial credit cards; and
- user transaction data from personal or business current accounts.<sup>53</sup>

This case study focuses primarily on the sharing of current account transaction data, which is expected to account for the majority of the impact of the standard.

The CMA order coincided with the EU Second Payment Services Directive (PSD2), which required all EU banks to grant users the right to share data with TPPs. While

<sup>52</sup> Open Banking Specifications, Retrieved from <https://openbanking.atlassian.net/wiki/spaces/DZ/pages/16385802/Specifications>

<sup>53</sup> Banks are in the process of complying with a requirement to allow TPPs to make transactions on behalf of users, for example initiating payment orders.

PSD2 requires banks to facilitate data access using APIs, it does not specify a particular standard.<sup>54</sup>

## 5.2 Economic framework

We developed an economic framework specific to the Open Banking context, which translates our underlying theories of change into a set of specific hypotheses describing the micro-economic channels through which the standard leads to wider benefits for individuals and the UK economy. An Open Banking specific logic model is in ANNEX A.

The following paragraphs set out the hypothesised effects of the standard in terms of its outputs, outcomes and impacts. Outcomes are grouped by theory of change for convenience. Section 5.3 proceeds to test these hypotheses, where possible, against evidence collected during the case study.

### Hypothesised outputs

- **Standards adoption and data sharing.** The standard is successfully adopted by a large share of financial services providers. By following a clear set of technical specifications and processes, providers adopting the standard share data (or give users the right to share data) in a way that allows authorised TPPs to re-use it effectively.

### Hypothesised outcomes (information)

- **New products and insights available to users.** As a result of users being able to share data with authorised TPPs in a standardised way, firms create and improve financial service products tailored to users' needs and financial habits.<sup>55</sup> The availability of these new tools leads to more data being made available, and more information and insight being generated for individuals and small businesses.

### Hypothesised outcomes (competition)

- **User switching between account service providers.** The standard makes product and current account data more comparable across financial services providers.<sup>56</sup> This helps users to compare the price and quality of services offered by different providers and empowers them to switch providers to get better or cheaper financial products. This in turn increases competitive pressure between providers in the long run, leading to lower prices, greater choice and higher quality of financial services offered to users.
- **Product unbundling, market entry challenging incumbent banks.** As a result of mandated data sharing and the standard, barriers to entry in the financial services industry are lowered. Access to users' current account transaction data through the standard allows authorised TPPs to provide services that are linked to users' current accounts. Because they can build their services onto standardised user account data, TPPs do not have to offer a full

<sup>54</sup> Fingleton Associates and the Open Data Institute, (2019), 'Open Banking, Preparing for Lift Off', Retrieved from <https://www.openbanking.org.uk/wp-content/uploads/open-banking-report-150719.pdf>

<sup>55</sup> For example, financial transaction data from users' current accounts, financial products data from bank's websites, utility bills data from energy and telecoms companies' websites.

<sup>56</sup> Banks, building societies, account service providers.

bundle of account and lending products in order to enter the financial services market, but can instead compete with banks offering specific, unbundled products. This enables TPPs to exert competitive pressure onto incumbent banks for different subsets of their services, leading to lower prices, greater choice and higher-quality products for users.

### Hypothesised outcomes (ecosystem)

- **An ecosystem of innovating firms.** Data sharing through standardised APIs allows more local firms to become familiar with standardised data and establish themselves in the wider financial services market. These firms may have a head-start over firms in other jurisdictions and may potentially form a self-reinforcing commercial ecosystem. Existing firms respond to increased innovation levels by developing their product offering.

### Hypothesised impacts

- **Changes in consumer trust.** As a result of personal data being shared and used by multiple authorised TPPs, and because of standardised data sharing processes, users change their trust towards the organisations that hold, share and re-use their personal data (conditional on wider context). Trust influences users' propensity to share data, depending on their perceived risk of data breaches, fraud and other harms that may arise from personal data exploitation for business purposes.
- **Financial wellbeing and organisational efficiency.** Because of more tools and insights created (information), and higher-quality/lower-priced products (competition), businesses increase their efficiency, and individuals are empowered to make better financial decisions and improve their financial wellbeing.

## 5.3 Findings

This section summarises the qualitative and quantitative evidence collected as part of the case study process.

The case study allowed us to test many of the hypotheses identified in the logic model. It provides mostly qualitative insights into the impacts that the standard has on the economy and identifies the most relevant channels leading to these impacts. This was augmented with monitoring data on the development and adoption of the standard, and an empirical example demonstrating the link between the standard and wider impacts under a set of realistic assumptions.

The evidence presented is generally not directly attributed to the individual stakeholders to avoid disclosing sensitive information.

Unlike the OpenActive case study, there is a single counterfactual against which the Open Banking standard can be compared. In the absence of the Open Banking standard, banks would still be required to facilitate data access through open APIs under the PSD2 regulation. However, without a standardised API specification to follow, banks would develop their own APIs, and data formats and technical specifications would likely differ across providers. TPPs would bear the cost of collecting and standardising data from different banks. Moreover, users would

have to navigate different interfaces when authorising the transfer of personal data from one provider to another.

As Open Banking simultaneously mandated both a right to data portability and the standard, it is challenging to isolate the impact of standards from the impact of mandated data portability. Indeed, many of the stakeholders provided evidence of how Open Banking compares to the manual techniques that TPPs previously used to access current account data (e.g. screen scraping, where users share their bank username and password with a third party and permit them to access their account). Manual data extraction implies heterogeneity in data sharing experienced both by users and TPPs, and potentially exposes users to greater risks of data mishandling and fraud.

### 5.3.1 Outputs

As a result of mandated data portability (dictated by PSD2 and the CMA order) and the requirement to comply with the standard, the largest nine UK banks (see Figure 8) adopted the standard.

These banks facilitate access to data on user current accounts through standardised APIs, opening up around 95% of current account data.<sup>57</sup>

**Figure 8 List of CMA 9 banks**

Bank
AIR Group (UK) plc
Bank of Ireland (UK) plc
Barclays Bank plc
HSBC Group
Lloyds Banking Group plc
Nationwide Building Society
Northern Bank Limited
The Royal Bank of Scotland Group plc
Santander UK plc

Source: <https://www.openbanking.org.uk/about-us/glossary/>

Although outside of the regulatory scope of the CMA Order, 31 other financial institutions<sup>58</sup> (non-CMA 9 banks) have voluntarily adopted the standard since the launch of Open Banking, opening up an additional segment of the retail banking market.

<sup>57</sup> Fingleton Associates and the Open Data Institute, (2019), 'Open Banking, Preparing for Lift Off', Retrieved from <https://www.openbanking.org.uk/wp-content/uploads/open-banking-report-150719.pdf>

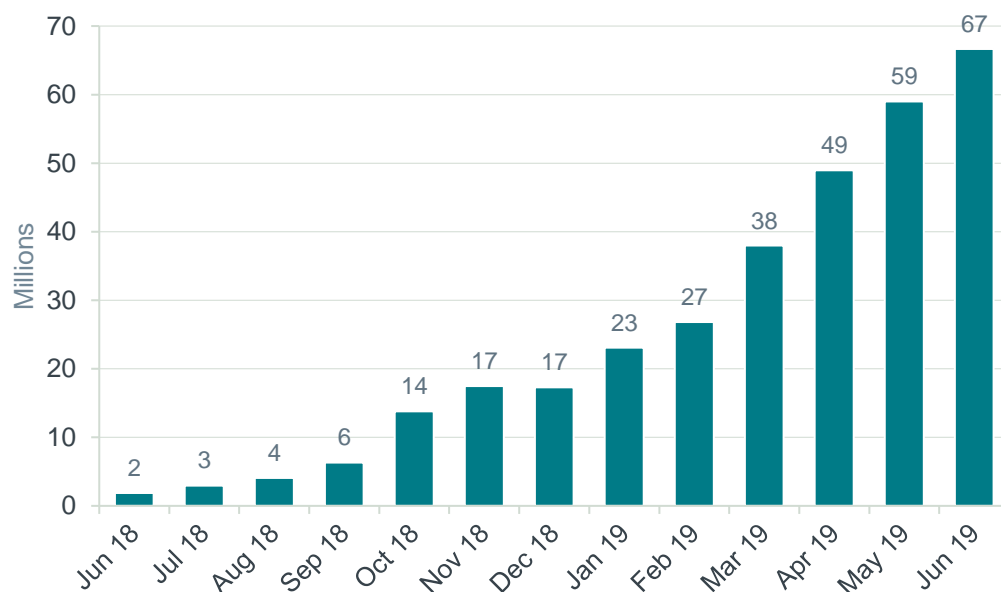
<sup>58</sup> Open Banking, 'List of Regulated Providers', Retrieved from <https://www.openbanking.org.uk/provider-categories/account-providers/page/4/>

Allstar Business Solutions Limited, C Hoare & Co, Clydesdale Bank PLC, Contis Financial Services Limited, Coutts & Company, Creation Financial Services Limited, Cynergy Bank Limited, Hargreaves Lansdown Savings Ltd, ICBC (London) plc, Industrial and Commercial Bank of China Limited, Investec Bank PLC, Marks & Spencer Financial Services Plc, MBNA Limited, Metro Bank PLC, Mizuho Bank, Ltd., National Westminster Bank Plc, NewDay Ltd, Northern Bank Limited, Permanent TSB Plc., Prepay Technologies Ltd, Revolut Ltd, Sainsbury's Bank Plc, SG Kleinwort Hambros Bank Limited, Starling Bank Limited, Tesco Personal Finance PLC, The Co-operative Bank Plc, Tide Platform Limited, TSB Bank plc, Ulster Bank Ireland DAC, Ulster Bank Ltd, Vanquis Bank Limited, Yorkshire Building Society.

One stakeholder noted that smaller, non-regulated banks, although not required to facilitate access to current account data in a standardised way, do have an incentive to voluntarily adopt the standard – they are required to facilitate data access under PSD2 and would otherwise bear the costs associated with building their own standard.

Monitoring data collected by the Open Banking Implementation Entity suggests that the volume of data shared through the standard has increased steadily in the year since the launch of Open Banking. Figure 9 shows that the number of successful API calls, a proxy for the volume of data transferred using the standard, increased to almost 70 million per month in June 2019.<sup>59</sup>

**Figure 9 Successful API calls over time**



Source: <https://www.openbanking.org.uk/providers/account-providers/api-performance/>

### 5.3.2 Information theory of change

#### KEY MESSAGES

- Open Banking products generate more insight for users. However, the standard has made a limited contribution in enabling the development or user take-up of these products.
- New insights can potentially improve personal users' financial wellbeing and business users' efficiency, but it is not possible to disentangle the impact of the standard from the wider Open Banking regulation.

<sup>59</sup> An API call is the communication process through which a TPP accesses a user's data from a data provider (usually a bank), subject to user consent.



### Open Banking products generate more insight for users

At present, the two main products offered under Open Banking are account aggregation services and personal finance manager services.<sup>60</sup>

- Account aggregation services allow bank users to view their account information and transaction history from different bank accounts through a single platform.
- Personal finance manager services provide users with insight on how they spend their money, making budgeting recommendations and suggesting cheaper alternative for products such as utilities.<sup>61</sup>

Evidence from the case study suggests account aggregation generates new insight for users. One stakeholder stated that aggregation services unlock new opportunities for users to access products from different banks more easily, reducing time to gather insights on their finances, and potentially leading them to save more money or spend differently.

One stakeholder highlighted how Open Banking led several regulated banks (e.g. HSBC and NatWest) to launch their own account aggregation applications. They confirmed these applications could make products more accessible to those bank users who were less engaged with the market, and who were not aware of services offered by TPPs.

### There is no evidence that the standard has made a substantial contribution in enabling the development and use of these products

Evidence from the case study suggests that the standard has mitigated some risks and consistency issues associated with data sharing.

- One stakeholder noted that the standard's technical specifications allow banks to facilitate data access in a secure environment, adding that risks associated with data sharing are lower than they would be in a screen scraping scenario.
- More than one stakeholder stated that the standard helps minimise the risk of misinterpreting the way a user account balance is represented (e.g. establishing whether savings account balances or pending payments should be included in the total balance). If different banks were allowed to publish user account data using bespoke standards, as would be expected in the counterfactual scenario, it is likely that user balances would be less comparable across banks.
- One stakeholder noted that, although the standard removes some frictions, there is still a significant amount of data processing that needs to be performed to re-structure user data to allow for tailored services to be built.
- One stakeholder noted that there are costs associated with "building too much complexity and optionality into the standard".

Based on this evidence, we conclude that the standard is likely to reduce data inconsistencies and result in a marginal improvement in the quality of TPP

<sup>60</sup> Fingleton and the Open Data Institute, (2019), 'Open Banking, Preparing for Lift Off', Retrieved from <https://www.openbanking.org.uk/wp-content/uploads/open-banking-report-150719.pdf>

<sup>61</sup> For example energy and mobile phone bills, markets "where inactive customers face a 'loyalty penalty', as stated in Fingleton and the Open Data Institute, (2019), 'Open Banking, Preparing for Lift Off', Retrieved from <https://www.openbanking.org.uk/wp-content/uploads/open-banking-report-150719.pdf>

applications and service. However, this is unlikely to make a substantial contribution to the amount and quality of insight available to users, which is primarily driven by the wider Open Banking regulation.

### **New insights could potentially improve financial wellbeing and business efficiency**

The ability to collate all their accounts in one platform and to obtain budgeting suggestions can be beneficial for individual users' financial wellbeing and could theoretically result in higher savings rates or lower borrowing rates in the long run. However, a stakeholder we interviewed noted that such services are only likely to have benefits for users with more than one current account; a small fraction of current account holders.

Open Banking products can also help small businesses to combine their accounting information and financial transactions, allowing them to receive more accurate insight into their business performance and run their business more efficiently on a day-to-day basis (e.g. raise and track invoices, move money and pay bills).<sup>62</sup>

However, such benefits could only be attributed to the standard (rather than Open Banking more generally) if the standard was instrumental in facilitating the development and uptake of these products. As there is limited evidence that this is the case, there is insufficient evidence to conclude that the standard has led to a significant increase in individual wellbeing or business efficiency through the information theory of change, compared to what would have been expected in the counterfactual.

## **5.3.3 Competition theory of change**

### **KEY MESSAGES**

- User switching between account service providers has been limited so far, and any changes in future switching cannot be attributed to the standard based on our evidence.
- The standard enables unbundling of financial products by ensuring consistency in the data-sharing journey consumers need to complete to use third party services, and by lowering friction in handling data flows for TPPs.
- Unbundled financial products can result in better value financial products, potentially leading to improved wellbeing and lower financial distress, particularly for vulnerable users. The role of the standard in unlocking these effects can be identified only in specific cases and cannot be generalised.
- Greater familiarity with a standardised user journey and TPP accreditation process might increase user trust in how their data is handled by third parties.

<sup>62</sup> Reynolds, F., and Chidley, M., (2019), 'Consumer Priorities for Open Banking', Retrieved from [https://www.ofgem.gov.uk/system/files/docs/2017/10/state\\_of\\_the\\_market\\_report\\_2017\\_web\\_1.pdf](https://www.ofgem.gov.uk/system/files/docs/2017/10/state_of_the_market_report_2017_web_1.pdf)

### User switching between account service providers has been limited so far, and any future changes in switching behaviour cannot be attributed to the standard

We tested the hypothesis that the Open Banking standard enables users to better compare information across different account service providers, encouraging them to shop around for better products/lower prices and switch providers where appropriate. This is a key hypothesis given that the low levels of switching were a key motivation for the introduction of Open Banking.

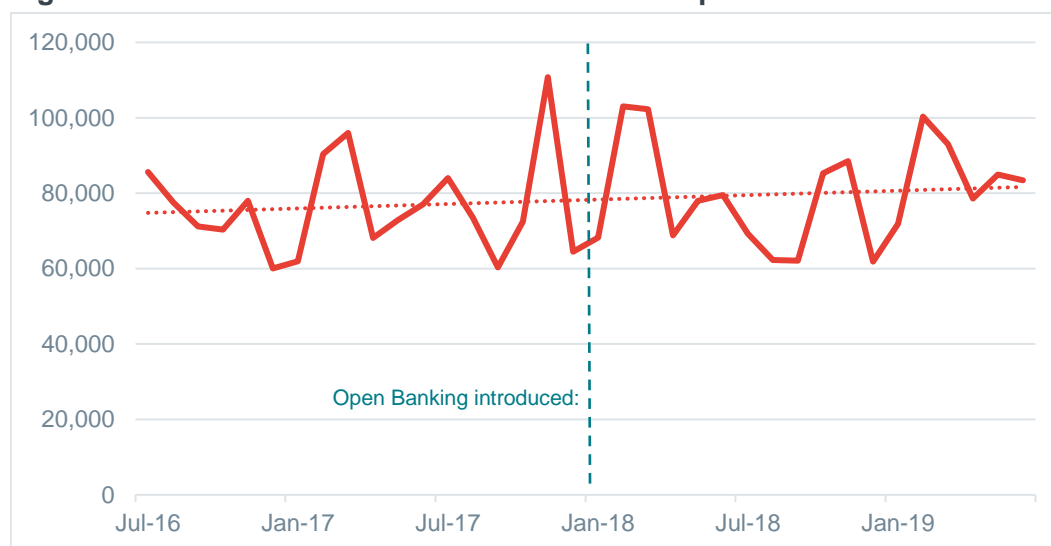
The literature hypothesises that, as a result of current account data being shared through standardised APIs, price comparison websites could access users' transaction histories and spending habits, generating more tailored recommendations to help them choose the most appropriate product for their circumstances.<sup>63</sup> This could in turn enable users to switch account provider, creating competitive pressure on providers to offer better deals and increase the quality of their services.

BACS Research<sup>64</sup> shows that some users would benefit from switching current accounts, particularly:

- account holders who make frequent use of overdrafts; and
- account holders with consistently high positive balances.

However, the quantitative evidence demonstrates that the rate of current account switching has been consistently low and stable over time (see Figure 10).<sup>65</sup>

**Figure 10** Number of current account switches per month



Source: Frontier Economics analysis of BACS data, <https://www.bacs.co.uk/resources/factsandfigures/pages/currentaccountswitchservicestatistics.aspx>

<sup>63</sup> Open Banking Ltd, 'What is Open Banking?', Retrieved from <https://www.openbanking.org.uk/customers/what-is-open-banking/>

<sup>64</sup> Bacs (2017), 'What Constitutes an Effective and Competitive Current Account Market?', Retrieved from [https://www.bacs.co.uk/documentlibrary/cass\\_switch\\_report\\_4\\_apr17.pdf](https://www.bacs.co.uk/documentlibrary/cass_switch_report_4_apr17.pdf)

<sup>65</sup> Ibid.

There is no evidence that Open Banking has resulted in an increase in the switching rate. This suggests that currently available account comparison tools, even though they could generate insights for users by enabling them to better compare products from different providers,<sup>66</sup> have not triggered significant consumer switching.

Two stakeholders observed that limited switching is likely due to the fact that most current accounts are free at the point of use, and product differentiation between current accounts is not substantial. Hence, the current accounts market lacks important characteristics such as price and product differentiation that generally drive switching behaviour.

Furthermore, there is no evidence that the standard has enabled price comparison websites to offer more personalised recommendations than before. One stakeholder observed that currently there are no providers offering account suggestions tailored to users' history. It is, therefore, unlikely that any switching can be attributed to the standard.

### **TPPs have the potential to provide unbundled financial products and challenge market incumbents in the long run**

As Open Banking allows individuals to grant authorised TPPs direct access to transaction data, TPPs can offer unbundled financial products to users and compete with incumbent banks. For example, Open Banking allows users to access third party lines of credit services without switching away from their current account provider. In theory, the ability to simultaneously use products from different providers (multi-homing) could increase competition for individual products, rather than allowing incumbent banks to constrain users to a defined bundle of products.

We found some evidence to demonstrate the importance of unbundling:

- One stakeholder observed that TPPs have started competing for the most profitable portion of the retail banking market (such as the provision of overdraft services), noting that banks generate more profit from credit products than from current accounts.
- Another stakeholder noted that competitive pressure is most likely to be exerted where threat of profit erosion is greatest.

### **There is evidence that the standard enables the unbundling of financial products by ensuring consistency in the user journey and reducing data handling frictions**

There is evidence that standardisation of the *user journey* – the process a user follows to share their current account transaction data with TPPs – has contributed to product unbundling:

- More than one stakeholder observed that the standardisation of the user journey allows users to build familiarity with the process of sharing data with different providers, increasing the amount of data they ultimately share with TPPs. This data sharing can facilitate unbundling.
- Another stakeholder noted that app-to-app authentication, mandated by the Open Banking standard, significantly increases the likelihood that a user would

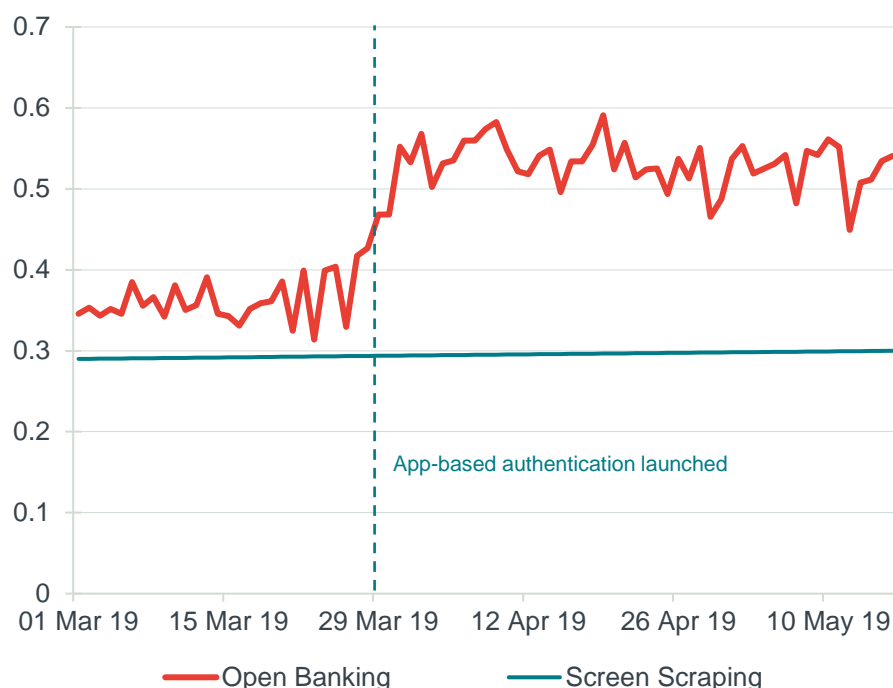
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<sup>66</sup> As articulated in the information theory of change.

share data. In a counterfactual in which each bank facilitates data access through different APIs, users would have to go through a more convoluted and unfamiliar journey to authorise the sharing of data with a TPP. The likelihood that users complete the authentication journey and use third party services would be lower in this counterfactual.

Account Technologies, a third-party provider of overdraft services including Safety Net Credit and Tappily, provided quantitative evidence demonstrating that the number of individuals signing up for their products increased significantly because of standardised app-to-app authentication (see Figure 11).<sup>67</sup> The figure shows that the authentication completion rate (a proxy for user take-up of third party services) for Nationwide users has increased from approximately 35% to approximately 50% since the launch of a standardised app-to-app authentication in March 2019.<sup>68</sup> Indeed, the average increase in completion rates attributable to the standard for all banks is approximately 11.8%, according to data provided by Account Technologies. This implies that a complicated and inconsistent authentication process was a key barrier preventing users from allowing Account Technologies to access their data.

**Figure 11 Authentication completion rate before and after app-based authentication**



Source: Account Technologies analysis

In addition to the user journey, one stakeholder observed that the standard's consistent design allows it to more efficiently handle large data flows, reducing administrative costs of its overall service provision.

<sup>67</sup> SafetyNet Credit is a third-party lending product that competes directly with unauthorised overdrafts, facilitating automatic borrowing of up to £500 per user when the user's account balance goes below a pre-set threshold, preventing them from incurring bank charges on unauthorised overdrafts. Tappily is a third-party lending product that competes with authorised overdrafts.

<sup>68</sup> Data from Account Technologies.

This evidence demonstrates that unbundling effects are not driven solely by mandated data access but are also enabled by more consistent processes and a smoother user journey.

**Unbundled financial products can result in better value financial products, potentially leading to improved wellbeing and lower financial distress for vulnerable users**

There is evidence that product unbundling resulting from the standard translates into improved wellbeing for users, particularly vulnerable users.

Evidence from the case study provides two qualitative examples of how this might occur.

- One stakeholder noted that banks have historically assessed overdraft applications on the basis of credit reference agency data, leading to vulnerable users with poor credit histories being denied authorised overdrafts. They noted that “if a customer missed a bill payment... they would not qualify for an authorised overdraft”. By using shared data, third party overdraft providers can “conduct more accurate, real-time assessments of a customer’s credit history and can offer services to those who would be denied a bank overdraft”. Fairer credit profiling enabled by the standard can therefore improve vulnerable users’ access to lending products.
- Another stakeholder observed that debt collection and restructuring products facilitated by the standard reduce the stress experienced by vulnerable users. They noted that, instead of forcing the user to deal with all of their creditors separately (the average indebted user has six creditors), the standard allows debt advisers to connect directly with creditors, securely access creditor documentation (credit agreement, payments outstanding etc.) and share details on a user’s financial situation with the creditor. This ensures a less stressful experience for users and has the potential to improve financial wellbeing in the long run.

Stakeholders, however, noted that these effects are unlikely to have had a material impact on the financial services market as only a small proportion of individuals currently use these products.

The main quantitative evidence on the link between the standard and consumer welfare comes from the third-party overdraft market. The following box presents an empirical example of the potential impact of standards on user welfare in this context, based on evidence from the Financial Conduct Authority (FCA) and Account Technologies.

The example suggests that product unbundling is likely to result in better deals for users in the form of lower interest rates on borrowing products. This is primarily because the smoother user journey enabled by the standard increases the number of individuals who are able to take advantage of the cheaper, unbundled product. This example provides insight into how the effects of data standardisation could apply to other financial products in the long run.

## EXAMPLE: UNBUNDLED OVERDRAFT SERVICES

The FCA considers bank overdraft charges to be excessive, particularly for those with unauthorised overdrafts.<sup>69</sup> Unbundled overdraft services offer an alternative for users to borrow at more favourable rates. These services require access to user current account data to profile the users and identify when they are at risk of going into overdraft. Therefore, a smooth user authentication journey and the seamless transfer of transaction data are vital enablers of these products. Benefits arising to users who access these products because of improvements in the user journey enabled by the standard can therefore be attributed to the standard specifically rather than to Open Banking in general.

**Step 1:** Since the standard's guidelines on app-based user authentication were launched in March 2019, banks who adopted the standard have increased their authentication completion rate for Account Technologies products by 11.8% more than banks who did not adopt the standard.

**Step 2:** Knowing that approximately 10,000 individuals apply for Account Technologies products each month, approximately 1,000 new users per month can therefore be attributed to the standard. Based on evidence on the share of users with access to authorised bank overdrafts, we concluded that 500 of these users were previously using unauthorised bank overdrafts while 500 were previously using authorised bank overdrafts.

**Step 3:** Evidence from Account Technologies and the FCA implies that:<sup>70</sup>

- The average user who was previously using unauthorised bank overdrafts saved **£40-£70** per year from switching to Safety Net Credit.
- The average user who was previously using authorised bank overdrafts saved **£180-£300** per year from switching to Tappily.

**Conclusions:** Using the above evidence, we can estimate that over the course of one year, the standard would help **12,000 additional users save a total of £1.3-£2.2 million per year**. This figure would be expected to increase as the standard enables more users to sign up for the third-party overdraft products (40 million individuals use overdraft services every year).<sup>71</sup>

Given that applicants to unbundled overdraft services like Safety Net Credit and Tappily spent between 4% and 8% of their income on bank charges,<sup>72</sup> estimated savings from switching over to unbundled overdraft services are likely to materially affect users' financial wellbeing, with greater impacts expected for financially vulnerable users.

<sup>69</sup> Financial Conduct Authority, (2018), 'High-Cost Credit Review: Overdrafts Consultation Paper and Policy Statement', Retrieved from <https://www.fca.org.uk/publication/consultation/cp18-42.pdf>

<sup>70</sup> Ibid.

<sup>71</sup> Ibid.

<sup>72</sup> Reported by Account Technologies.

### Greater familiarity with a standardised user journey and TPP accreditation process might increase user trust in how their data is handled by third parties

According to two stakeholders, the standard provides for a safer and more consistent environment to share data. Greater familiarity with a standardised journey allows users to “spot whether there is something wrong” throughout the data sharing process, leading them to increase their sense of control over the sharing of data. This might be expected to increase their trust in how their financial data is handled by third parties (conditional on wider context), and to make them more comfortable sharing financial data in the future.

One of the stakeholders noted that the standard does not guarantee control and safety over customer data after the data transfer has occurred. They called for broader consideration of the security of the overall banking environment, especially around the management of user consent.

Another stakeholder added that attitudes towards data sharing are heterogeneous, varying according to age, ethnicity, financial literacy and income levels. Therefore, as multiple factors play into a user decision to share personal data, any benefits arising from a more standardised user journey might impact only those users who are more willing to share data to begin with.

## 5.3.4 Ecosystem theory of change

### KEY MESSAGES

- The standard lowers costs of collecting user data for some TPPs but creates new costs for other operators who need to manage increased complexity created by the standard.
- The reduction in costs generated by the standard has led to new TPPs entering the market. However at this stage, the number of active providers is low, the range of innovative financial products supplied by third parties is limited, and incumbent banks’ response to these products has been slow.

### The standard lowers costs of data sharing for some TPPs, but creates new costs for other providers

We tested whether sharing data through standardised APIs lowers the cost faced by TPPs in acquiring user data from banks.

The standard reduces TPP costs of dealing with inconsistencies across banks. Furthermore, the collaborative approach to the standards development process, and the robust documentation underpinning it, means that the standard provides a more secure operating environment for TPPs than might be expected in the counterfactual.

There is a range of evidence from the case study to support this hypothesis:

- Two stakeholders suggested that, if banks were not obliged to comply with the standard, it would be more expensive for TPPs to extract current account transaction data from API interfaces.



- Another stakeholder noted that the standard allows TPPs to build products and services more quickly, lowering the investment costs associated with acquiring user data.
- Another stakeholder suggested that, in the counterfactual, TPPs would bear the cost of standardisation.
- Finally, one TPP reported that its conversion rate doubled after it started acquiring all its users through the standard, implying a 50% reduction in marketing costs per new user acquired.

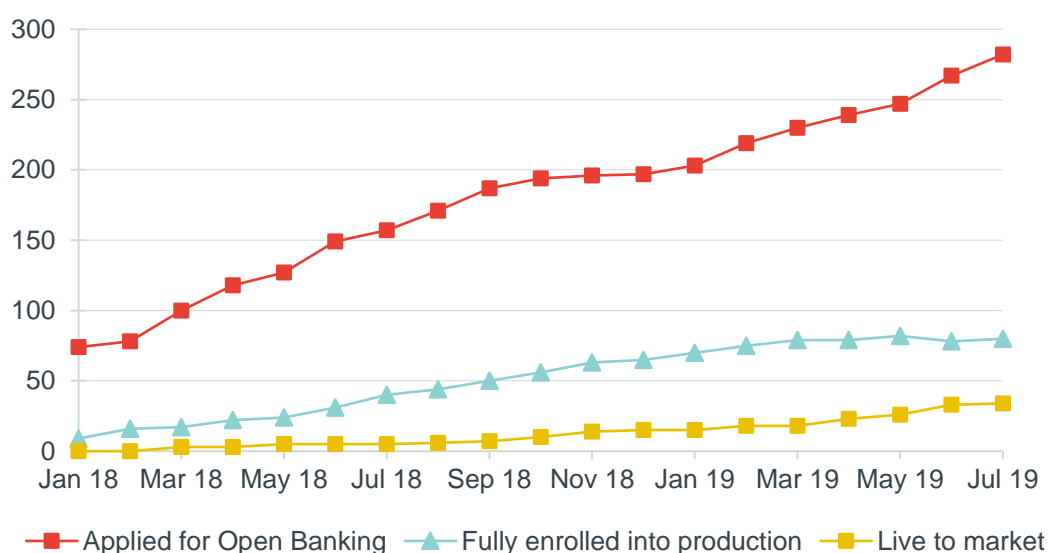
However, there is also evidence that the standard might create new costs for some providers, particularly for banks that are required to implement standardised APIs:

- One bank observed that it incurred costs in adapting its existing standard to comply with the Open Banking standard.
- One TPP reported that the standard does not remove all the costs arising from data processing and re-purposing.

**Lowered costs lead to new TPPs entering the market, although the number of active TPPs is currently low**

Evidence from OBIE shows a slow but steady increase in the number of TPPs offering services to retail banking users following the launch of Open Banking in 2018. Figure 12 shows that 282 TPPs have applied to offer services as an Open Banking registered provider, 80 have been approved by the FCA and 34 are currently live to market (although only five to ten of these have meaningful user volumes, according to a stakeholder).<sup>73</sup> This implies that entry in a regulated market like banking is slow and the full benefits from developing an ecosystem of innovative firms are likely to materialise only in the long run.

**Figure 12 Open banking TPP funnel**



Source: OBIE monitoring data

<sup>73</sup> Figure updated to July 2019.

Although reduced costs for TPPs might boost market entry, there is insufficient evidence to conclude that the standard has significantly increased the number of new and innovative firms. However, one stakeholder did note that the standard has generated the need for technical service providers to enter the market, creating a marketplace where operators offer services, “just to make sense of the standard”.

### Examples of innovative financial products supplied by TPPs are currently limited, and banks’ response innovation to these products has been slow

Three stakeholders suggested some examples of innovative third-party products currently operating in the market. These include:

- **Plum:** A micro-savings platform that analyses user spending and helps them save small sums of money automatically.
- **Tully:** A service offering budgeting and personalised debt solutions to individuals in financial difficulty.
- **Yolt:** A personal financial manager offering budgeting advice and notifications on better deals on personal expenses (e.g. utility bills).
- **Consents.online:** A tool to manage online consent allowing users and small businesses to view who is accessing their information under Open Banking and giving them the opportunity to revoke access consent at any time, all managed through a single platform.<sup>74</sup>

Case study evidence points to a few examples of how traditional banks have responded to the market entry of innovative TPPs so far.

One stakeholder noted that many traditional banks (Barclays, HSBC, NatWest etc.) started offering new products like account aggregation following the launch of Open Banking and partnering with TPPs to provide innovative services. Some examples include:

- HSBC’s partnership with Account Scores (to create Consents.online);
- RBS’s creation of two new online banks; and
- HSBC’s partnership with Bud (account aggregation and budgeting).

Although the above cases display the potential innovations arising from Open Banking and the standard, there is limited evidence of substantial product innovation to date. One stakeholder noted that, so far, there “has not been substantial innovation in the what, only innovation in the *how*”.

Moreover, there is insufficient evidence to attribute any increase in the number of innovative firms to the standard.

## 5.3.5 ODI contribution

In 2014, HM Treasury commissioned the ODI and Fingleton Associates to assess the opportunities for improving UK banking.<sup>75</sup> The resulting report argued that “greater access to data had the potential to help improve competition in UK

<sup>74</sup> Finextra, ‘Consents.Online to Provide Architecture for HSBC Open Banking Platform’, Retrieved from <https://www.finextra.com/pressarticle/73943/consentsonline-to-provide-architecture-for-hsbc-open-banking-platform>

<sup>75</sup> Fingleton Associates and the Open Data Institute, (2019), ‘Open Banking, Preparing for Lift Off’, Retrieved from <https://www.openbanking.org.uk/wp-content/uploads/open-banking-report-150719.pdf>

banking” and concluded that “policy initiatives would benefit from employing more common technology and standards for data sharing”.<sup>76</sup>

In 2015, the ODI helped establish the Open Banking Working Group in order to further “explore how data could be used to help people transact, save, borrow, lend and invest their money, and to ensure a standard was put in place to protect privacy and ensure the data is secure”. The Open Banking Working Group developed the framework for the standard, establishing a set of technical rules and implementation guidelines for sharing banking data.

In 2016, the CMA established the Open Banking Implementation Entity to develop and implement the standard, and to work with a wider group of stakeholders to incentivise and facilitate its adoption. In 2017, the CMA order mandated the sharing of data through standard API’s for regulated banks responsible for 95% of the current account market.

As such, while the CMA market investigation provided the impetus for the exploration of open banking, the ODI played an important role in drafting the initial report, establishing the Open Banking Working Group, coordinating stakeholders and developing the framework for the standard.

It is, therefore, plausible that a similarly robust standard would not have been developed and adopted in a similar timeframe in the absence of the ODI.

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<sup>76</sup> Ibid.

## 6 COMPARISON OF FINDINGS

While it is not possible to extrapolate from the case studies to form conclusions about the aggregate impact of open standards for data, we are able to make a number of high-level observations by comparing the two case studies.

### **The returns to standards with a single, clearly defined objective are more straightforward to estimate**

OpenActive has a clearly defined end objective: increasing physical activity to improve population health outcomes. While there are different channels through which this objective is realised, it is relatively straightforward to combine the effects of each channel into a single measure of impact. Conversely, Open Banking aims to facilitate a wide range of impacts, from reducing book-keeping costs for small businesses to minimising the indebtedness of vulnerable demographics.

For this reason, it is easier to draw credible conclusions about the aggregate impact of the OpenActive standard and other standards with a clearly defined objective, such as the brownfield land registers data standard or Represent, than for standards with a broader range of objectives such as *CSV on the Web* or Roadworks.org.

### **The requirement for regulation is dependent on the nature of the data**

In the case of OpenActive, the data is neither commercially sensitive nor personal and therefore has limited commercial value to private organisations (activity providers) that hold it. Indeed, activity providers benefit from information on physical activity opportunities being shared more widely. Activity providers are therefore likely to have an incentive to voluntarily share data and adopt a standard.

In the case of Open Banking, the data is both commercially sensitive and personal, and has commercial value for the private organisations (banks) that hold it. Therefore, there have historically been few incentives for banks to facilitate user access to data by adopting open standards for data. In such contexts, it is likely that access to data and the adoption of a standard will need to be mandated by a regulator.

### **The context-specific barriers to data access determine the contribution of standards**

In the case of OpenActive, the barriers to data access are primarily practical, relating to the difficulties of coordinating with other data providers and data intermediaries to develop a robust standard and encourage adoption. The development and adoption of open standards for data are therefore likely to be sufficient to address these barriers and the contribution of standards to the overall impact of the intervention will be substantial. Other contexts in which this is likely to be the case include the General Transit Feed Specification public transport data standard and the brownfield land registers data standard.

In the case of Open Banking, the barriers to data access are primarily commercial and privacy related. While standards may act as a facilitator once data access has been mandated, open standards data is insufficient to address these barriers in isolation. As practical barriers to data access are less relevant, the overall contribution of standards to any impacts of the intervention is likely to be relatively

small. Other contexts in which this is likely to be the case include the Midata energy standard and any future standard related to the sharing of data held by large technology companies such as Google and Amazon.

**The competition impact of standards depend on whether a lack of data sharing constrained competition.**

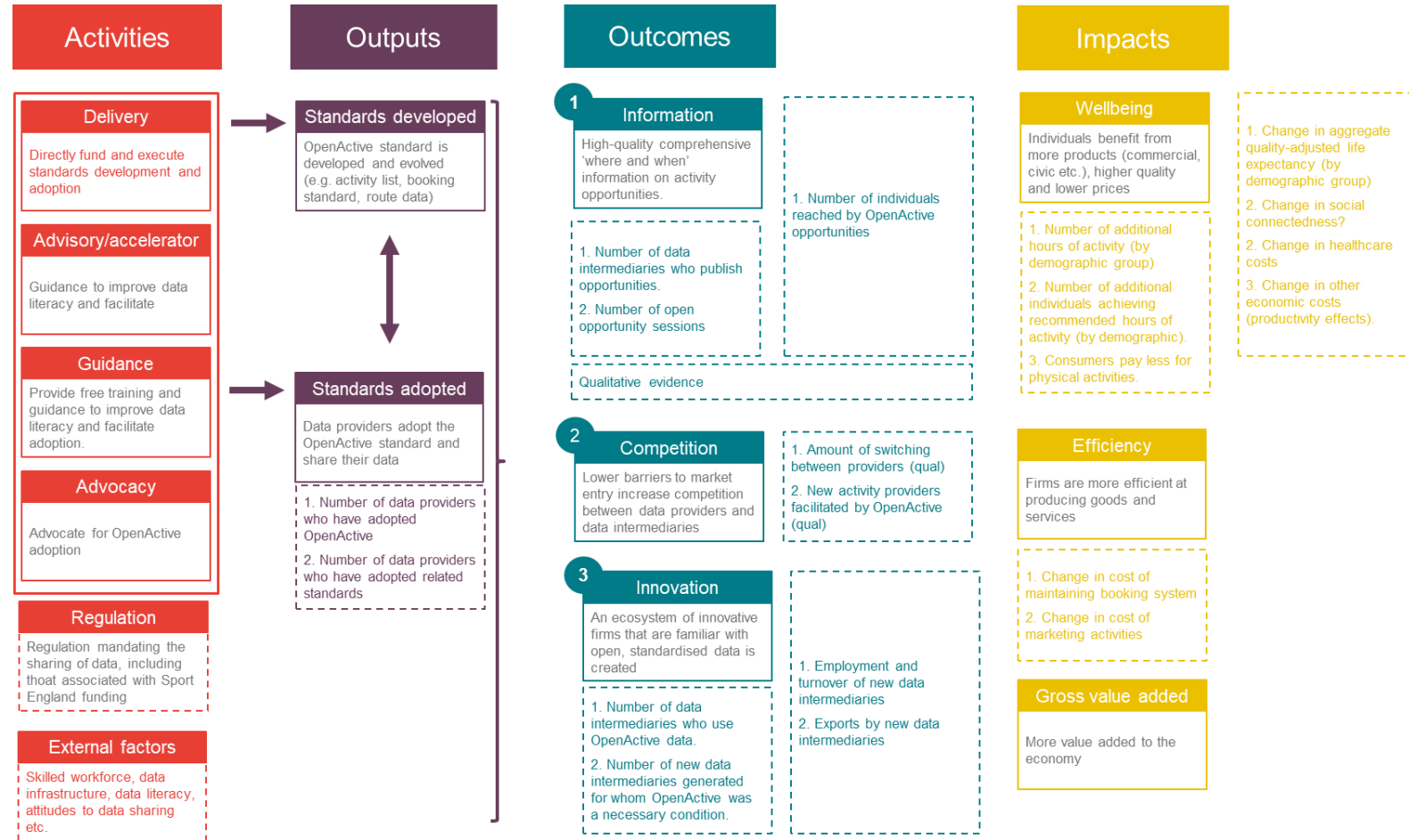
In cases where a standard (either alone or accompanied by regulation) leads to an increase in data sharing, whether or not an increase in competition follows depends on whether or not data sharing was the key barrier to consumers exercising greater choice in the first place. This can be seen in both the OpenActive and the Open Banking case studies to a degree.

In the OpenActive case study, whilst there may be an increase in competition between activity finders, it does not necessarily follow that there is any substantive increase in competition between activity providers. This very much depends on what causes existing users to switch between different activity providers. Locality is very important in this market and switching is only likely if more convenient, lower cost or higher quality activities are made available to existing users. As yet, there is no evidence that the standard has led to this impact.

In the Open Banking case study, there is no evidence that the standard has increased current account switching and hence competition between existing current account providers. This is likely to be because there are other consumer barriers to switching in this space that the standard does not overcome. The standard can still have positive impacts nonetheless, such as via unbundling of existing products, and may provide necessary conditions for future innovation to happen (e.g. the next generation of account aggregation products), leading to increased switching in the future.

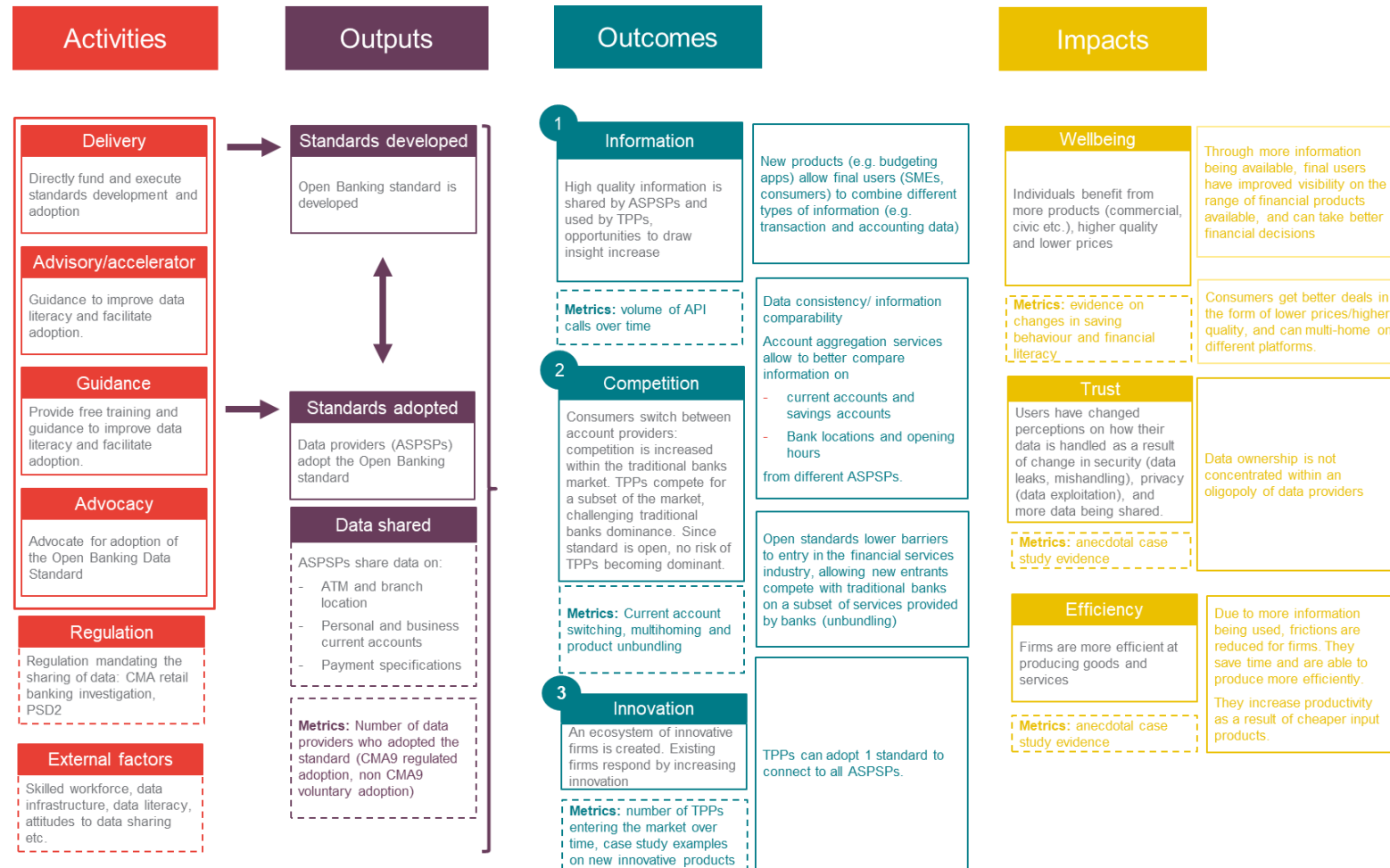
# ANNEX A CASE STUDY SPECIFIC LOGIC MODELS

## OpenActive



Source: Frontier Economics analysis

### Open Banking



Source: Frontier Economics analysis

