

# Frontier Economics: Estimating the benefits to third party providers and small and micro firms from Smart Data

Frontier Economics report

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### Aims of this analysis

In September 2020, the Department for Business, Energy and Industrial Strategy (BEIS) announced proposals to create primary legislation, which would extend government's powers to mandate participation in Smart Data initiatives. These proposals built on the 2019 Smart Data Review and the 2020 National Data Strategy. This could lead to secondary legislation to mandate participation in Smart Data initiatives in regulated sectors such as energy, communications and finance.

In keeping with best practice, BEIS is conducting an Impact Assessment (IA) of the effects of the proposed legislation. This builds on the IA conducted at the consultation stage, which began the process of scoping the costs and benefits of the reform on business, society and the economy. In the context of this work, the definition of Smart Data is focused on customer data that is given back to customers via third party providers (TPPs) in a way that enables those customers to make smart choices through the provision of innovative services.

Frontier Economics has been commissioned by BEIS to fill a particular gap in the IA: the benefits from Smart Data initiatives to small and micro firms (referred to as SMFs throughout this document) and to TPPs, focusing on SMFs and TPPs in banking, finance, energy and communications. The work provides an initial review of the evidence to demonstrate the potential scale of the benefits over a five-year timeframe. Further analysis is needed to understand and quantify more use cases that could occur under Smart Data initiatives in banking, finance, energy and communications. Not all use cases identified in this work were able to be quantified, due to lack of existing evidence.

Scenarios/sensitivity tests were used to demonstrate the range of potential benefits, as there remains significant uncertainty about potential use cases and uptake of these services across the sectors. Benefits were estimated separately for TPPs and SMFs across the four sectors:

- For TPPs, the estimates focus on potential relative productivity gains and growth in the number of TPPs; and
- For SMFs the estimates focus on potential cost savings.

This work does not include benefits to larger firms or society. It does not account for the costs of implementing Smart Data initiatives nor does it explicitly take into account the resources needed to implement Smart Data enabling legislation, including secondary legislation by sector regulators. See Figure 1 for a depiction of the scope of this work.

### Methodology

The methodology for this work had three main steps. Step 1 involved the creation of a conceptual framework for identifying the benefits that could potentially accrue to TPPs and SMFs as a result of Smart Data. Step 2 involved gathering evidence to quantify those benefits wherever possible. Step 3 involved the creation of a model to quantify the benefits and generate central estimates and sensitivities. As this is an initial analysis of the scale and scope of the benefits not all of the benefits identified in step 1 could be quantified within this work.

The work triangulated evidence from three main sources throughout: a literature review, seven interviews with experts in organisations across the four sectors and an expert panel covering all four sectors. The work was also iterated with BEIS to ensure consistency with other areas of the IA. The interviews and use of expert panel were particularly necessary for this work as there is limited existing evidence on Open Banking benefits to date as well as potential benefits for Open Finance, Open Energy and Open Communications: especially for TPPs and SMFs. Table 5 in the Annex provides the values and sources for the key inputs in the modelling, some of which come directly from the interviews.

The logic model for this work provides a theoretical representation of how the enabling legislation for Smart Data is expected to make an impact – its 'theory of change'. It provides a description of the expected causal chain to impacts and provides a framework to be used by evaluators to test whether movements along the links in the chain are happening as intended. Figure 1 sets out the logic model for this work, which looks at the high-level inputs, activities and outputs which lead to intermediate outcomes (benefits for TPPs), dependent outcomes (benefits for SMFs from the TPP Smart Data enabled services) and ultimate impacts. It also sets out what is in and out of scope. Figure 2 provides more detail on the intermediate and dependent outcomes which are specific to each sector.





Source: Frontier Economics analysis.

Figure 2 sets out a non-exhaustive list of potential use cases that have the potential to lead to benefits for TPPs and SMFs using these Smart Data enabled TPP services.

#### Figure 2: Details of use cases in intermediate and dependent outcomes, and impacts



Source: Frontier Economics analysis.

The impacts for TPPs and SMFs have been quantified in the modelling where possible but evidence was not available for every use case. For instance, non-price features identified in Figure 2 have not been quantified. Additionally, some impacts are estimated to occur outside of the modelled 5-year timeframe and are not quantified. These are discussed in the following section on the high-level findings.

Three broad scenarios were created to capture optimistic and pessimistic scenarios as well as the central scenarios. It was necessary to use a set of assumptions to underpin these estimates. These central assumptions are set out in the table below, and were viewed by experts as plausible and largely conservative assumptions. The experts covered the four sectors as well as TPPs and established players in these sectors. Details of the key inputs and sources for the modelling that sit alongside these assumptions are in Table 5 in the Annex.

Table 1: Ce	entral assum	ptions in th	ne methodology
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Central assumption	Justification
<b>Adoption rate</b> of Smart Data enabled services by SMFs: by year 5, 70% in banking and 55% in finance, energy and communications	Drawing on evidence of adoption rates of small firms under Open Banking, taking into account the uncertainty of uptake in finance, energy and communications. Finance, energy and communications have slower adoption rates in comparison to what has been seen in banking. Assumes not all SMFs will use Smart Data enabled services.
<b>2 year lag in sector opening</b> from now for finance, energy and communications	Taking into account the time needed to enact primary and secondary legislation, and for TPPs to enter the market.
Number of TPPs compared to banking: 66% finance; 20% energy; 28% communications	Scaling figures take into account experts' views on the number of potential use cases in each sector and relative sizes of the sectors.
<b>Split between new and existing</b> <b>TPPs</b> providing Smart Data enabled services: 71% new TPPs in banking and 56% new TPPs in finance, energy and communications	New TPPs in banking is based on experts' views of types of TPPs providing services through Open Banking, and this is held constant going forward. The percentage of new TPPs is lower in other sectors under the assumption that some TPPs in Open Banking will move into other sectors, existing TPPs in these sectors will use Smart Data for their services and new TPPs may enter more than one sector (therefore counting them as new in all sectors would be an overestimation). New TPPs are not considered to be existing firms.
<b>Open Finance</b> will have half the cost savings for SMFs <b>relative to</b> <b>what Open Banking</b> has provided	Open Finance estimates for SMF benefits are based on "what if" scenarios as there is insufficient evidence to say what the use cases and cost savings would be for SMFs. Expert opinion supports the view that the benefits will be of a smaller magnitude.

Open Banking has the most developed evidence about the evolution of TPPs and benefits to SMFs to date so this was taken as the starting point for the analysis. It was supplemented by conversations with experts to understand:

- How potential applications of Smart Data in other sectors might differ from Open Banking;
- How the different economics of other sectors (relative to banking) might imply a different scale or profile of possible benefits for TPPs and SMFs;
- What these applications and economic considerations imply for TPP business models; and
- What these applications and economic considerations imply for the nature, size of potential benefits to SMFs as well as the potential speed of adoption.

The components of the calculation for the benefits to TPPs is set out below:

- Benefits for TPPs: productivity gains in sector Y = number of TPPs x additional average productivity gain per TPP
- Where number of TPPs = number of TPPs in Open Banking x scaling of TPPs in sector Y compared to Open Banking x lag in sector Y opening
- Where TPPs are split into new and existing TPPs; and
- Where additional productivity gain per TPP = average additional productivity gain for tech sector (applied to new TPPs only) + average additional productivity rate of sector Y (applied to all TPPs)

New TPPs are expected to have higher productivity that is in line with tech sector productivity rates, rather than the traditional productivity rate of sector Y. This is because the new TPPs are expected to use data-driven decision making and e-business models, using Smart Data, in line with tech sector companies. The average additional productivity of the tech sector compared to other sectors has therefore been used to approximate the additional productivity of new TPPs. New TPPs are not considered to be existing TPPs in this analysis. Academic/think tank research papers on the average additional productivity of the tech/digital sector provided a range of estimates used to approximate the productivity gains of new TPPs relative to the rest of the economy (details in Table 5 in the Annex).

All TPPs, including existing TPPs, are expected to benefit from incremental productivity associated with Smart Data in their sector, over and above existing productivity levels. This additional productivity rate for sector Y captures how Smart Data will make it easier for firms to provide their services but will not provide them with significantly more data. New TPPs benefit from this incremental productivity in sector Y as well as the relative productivity gain equivalent to a tech firm. This is because the incremental productivity benefits all TPPs in sector Y. New TPPs have this improved sector productivity as well as the relative gain equivalent to a tech firm, as the tech productivity approximation does not specifically take into account the incremental benefits of Smart Data.

Without detailed productivity data on the firms across each of the four sectors, these findings are presented as relative productivity gains and not as absolute figures. The increase in productivity can be thought of as compared to the productivity of firms that do not rely on data-driven decisions and/or online data.

The components of the calculation for the benefits to SMFs is set out below:

- Benefits for SMFs in sector Y = number of SMFs adopting services x average cost savings per SMF
- Where number of SMFs adopting services = number of SMFs in the economy x adoption rate for sector Y;
- Where adoption rate = adoption rate of Open Banking x scaling for sector Y relative to Open Banking x time lag in sector Y opening; and
- Where average cost savings per SMF = estimates from stakeholders and literature review

Overall findings and distribution of benefits across sectors and between TPPs and SMFs were sense-checked with sector experts.

## High-level findings

The central findings are set out in Table 2. As set out in the Methodology, the main drivers of the findings are adoption rates, the lag in sector opening, the number of total TPPs compared to Open Banking and proportion of existing TPPs in each sector. For SMFs the cost savings identified are the other key component. The inputs for the central scenario for these are in Table 5 in the Annex.

For energy and communications, the cost savings are much lower than for banking and finance. Savings were restricted to those that result from an increase in SMF switching to better tariffs as a result of Smart Data. These are much smaller than the cost savings estimated from the wider range of Open Banking use cases, such as cloud accounting. The potential benefits from switching to a better tariff in communications are particularly low compared to Open Banking enabled benefits to SMFs, as the communications expenditure is much lower than for services affected by Open Banking.

Sector	Cost Savings (to the nearest £10m, 2019 prices net present value for 5 years) – SMF benefits
Banking	£29,450
Finance	£5,610
Energy	£70
Communications	£10
Total	£35,150

#### Table 2: Central assumptions findings for SMFs

Productivity benefits for TPPs are set out for each year of the analysis in Figure 3. It was out of scope of this initial piece of work to translate these into monetary estimates, and so these are presented as relative productivity gains. Under the central scenario, the additional average productivity benefit for new TPPs is estimated to be 7.8% higher than firms not making data-driven decisions using Smart Data (from average productivity of tech firms and an additional benefit from using Smart Data) and for existing TPPs it is 0.5% (from using Smart Data to enhance existing offerings).



Figure 3: Number of TPPs over time by sector

Source: Frontier Economics analysis.

Setting the assumptions and scenarios has a significant implication on the findings. The following two tables demonstrate the potential range of estimates across our three main scenarios, holding constant the 2 year lag to opening the sectors for Finance, Energy and Communications.

Sector	Pessimistic (nearest £10m, 2019 prices NPV)	Central (nearest £10m, 2019 prices NPV)	Optimistic (nearest £10m, 2019 prices NPV)
Banking	£27,100	£29,450	£31,800
Finance	£3,240	£5,610	£6,320
Energy	£60	£70	£80
Communications	£10	£10	£20
Total	£30,420	£ 35,150	£38,200

#### Table 3: Varying assumptions findings for SMFs

Scenario	Change in total TPPs by year 5	Additional productivity
Pessimistic	50% fewer than the central scenario for Finance, Energy and Communications (Banking does not vary the total number of TPPs).	New TPPs: 5.0% (fall of 2.7%) Existing TPPs: 0.0% (fall of 0.5%)
	Total number of TPPs is 870 compared to 1,041 in the central scenario.	
Optimistic	53% more than the central scenario for Finance, Energy and Communications (Banking does not vary the total number of TPPs).	New TPPs: 11.0% (increase of 3.3%) Existing TPPs: 1.0% (increase of 1.0%)
	Total number of TPPs is 1,216 compared to 1,041 in the central scenario.	

As this is initial, high-level analysis there are a few caveats that are necessary to consider when interpreting the results:

- When analysing the outcomes and impacts Frontier assume the inputs, activities and outputs in Figure 1 all occurred and were effective.
- Estimated benefits to TPPs and SMFs may constitute a transfer from service providers. For instance cost savings from switching to a lower communications tariff is a transfer of benefits from the communications service provider to the SMF, as the communications provider is losing the higher profit margin.
- The switching estimates are based on an increase in conversion rates under the assumption (guided by experts) that using Smart Data will not necessarily drive greater awareness of switching benefits. Conversion rates are the rate at which potential customers complete a switching process: an increase in conversion rates means that there is an increase in switching but not necessarily that more customers being the process of switching. This is a conservative approach compared to an assumption that more SMFs will starting the switching process.
- This assumes that the "waterbed" effect from competition has not occurred and that it does not occur within the five year period. The waterbed effect is where a change in one area has an opposite reaction in another area: often around increases and decreases in

prices<sup>1</sup>. In this context, Smart Data means that there could be more frequent switching in response to price. This means that introductory low price offers from existing suppliers might cease to exist or the price of those increase over time. The waterbed effect would be these price changes because customers are switching frequently enough that it is no longer profitable to use low introductory offers as not enough customers will then move on to higher prices after the introductory period. It is possible that Smart Data could lead to this outcome in the future, but the view from experts and stakeholders was that this will not happen in the five year time period modelled.

- With greater competition over time one would also expect the efficiency benefits that TPPs create to be competed away, as others enter the market and/or adopt the TPPs' business models. Competition economic theory tells us that companies that move first with a new product or business model have a competitive advantage over other companies, until this product or business model is widely adopted<sup>2</sup>. TPPs using Smart Data for new or improved services will have efficiency benefits in their business models that existing firms providing similar services will not. However, these relative efficiency benefits over other companies will disappear as others adopt similar approaches. The current views from experts is that this won't happen in the next 5 years and therefore has not been included in this modelling.
- Open Banking has the most developed evidence base but this is still a new market and evidence is continually emerging. The use cases and cost savings could continue to change and develop. For simplicity, we have assumed constant average cost savings in each of the five years for SMFs. There is scope for future analysis on this.
- Additional productivity from using Smart Data (for both existing and new TPPs) is currently based on an assumption that there would be small incremental gains for TPPs that have already found existing routes to market: stakeholder evidence is that this incremental gain is low but with no current detailed estimations of the size. There is scope for future analysis on this to identify more accurate potential increases in productivity as there is remaining uncertainty.

<sup>&</sup>lt;sup>1</sup> See for instance: Frontier Economics (2005), "The Waterbed Effect: a report prepared for Vodafone", https://www.accc.gov.au/system/files/Frontier%20report%20on%20waterbed%20effect%20-%20July%202005.pdf <sup>2</sup> See for instance: Agarwal, Rajshree, and Michael Gort. "First-Mover Advantage and the Speed of Competitive Entry, 1887–1986." The Journal of Law & Economics, vol. 44, no. 1, 2001, pp. 161–177. JSTOR, www.jstor.org/stable/10.1086/320279.

### Annex: input values and sources

The following inputs sit alongside the key assumptions set out in Table 1 for the central scenario. Confidential stakeholder inputs come from the interviews with experts in organisations in the relevant sectors.

Tuble 0. List of key inputs and sources for the central section
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Input name	Input value	Source and notes
Number of SMFs in economy in – year 1	5,936,500	DCMS number of firms with up to 49 employees in 2020
Average growth rate of SMF in economy	3%	DCMS number of small and micro firms average growth rate 2010-2019
SMF average cost saving: banking	£1,813	As indicative examples of savings attributable to Open Banking: Payroll and expense management cost reductions. <u>https://cebr.com/reports/cost-of-small- business-employment/</u> https://blog.pleo.io/en/manual-expenses
SMF average expenditure. Used to calculate Finance savings as the percentage of expenditure saved relative to the Open Banking cost savings	£234,970	Micro company average expenditure adjusted to 2019 prices. https://smallbusiness.co.uk/million-average- expenditure-uk-smes-2540658/
SMF average cost savings – energy	£6.48	Average saving from switching energy provider multiplied by the increase in conversion rates (which estimate the increase in switching) https://www.uswitch.com/gas-electricity/

SMF increase in conversion rate for energy switching	5.5%	Confidential stakeholder interviews: average of 3%-8% range
SMF average cost savings – communications	£1.08	Average saving from switching communications provider multiplied by the increase in conversion rates (which estimate the increase in switching).
		It should noted be that the data used to assume an average saving to switching communications provider refers to personal switching of communication services and not businesses switching communications provider. This is an approximation for micro companies but for smaller companies it is expected that the average cost savings to businesses switching communications provider are higher than that of personal switching and therefore this should be treated as a lower bound estimate. https://www.ofcom.org.uk/research-and- data/multi-sector-research/general- communications/pricing
SMF increase in conversion rate for communications switching	2%	Confidential stakeholder interviews: average of 1%-3% range
Number of TPPs in banking – year 1	300	Confidential stakeholder Total for existing and new TPPs
Number of TPPs in banking – year 5	700	Confidential stakeholder Total for existing and new TPPs
Additional productivity of new TPPs	7%	Average of sources estimating the additional productivity of tech firms: Brynjolfsson, Erik and Hitt, Lorin M. and Kim, Heekyung Hellen, Strength in Numbers:

		How Does Data-Driven Decision making Affect Firm Performance? (April 22, 2011 <u>https://www.ons.gov.uk/economy/economico</u> <u>utputandproductivity/productivitymeasures/ar</u> <u>ticles/informationandcommunicationtechnolo</u> <u>gyintensityandproductivity/2018-10-05</u> https://media.nesta.org.uk/documents/inside _the_datavores_technical_report.pdf
Incremental productivity growth of all TPPs	0.5%	The incremental productivity values that we use are arbitrary values, based on interview evidence that the availability of Smart Data will have a small effect on existing services. Existing TPPs are companies that are already using data and providing services to SMFs (or consumers/larger firms). Smart Data will not provide them with significantly more data but it will make it easier for them to provide the services they are already providing/ improve their current services.
Discount rate	3.5%	The Green Book Applied to real 2020 prices with 2% inflation used to convert future prices to 2020 base

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