

Evaluation Paper 18/2: the impact of bringing additional benchmarks into the regulatory and supervisory regime

October 2018

FCA evaluation papers

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Abbreviations used in this document

CP	Consultation Paper
EBA	European Banking Authority
ESMA	European Securities and Markets Authority
EU	European Union
FCA	Financial Conduct Authority
FEMR	Fair and Effective Market Review
FSB	Financial Stability Board
ICE	InterContinental Exchange
IOSCO	International Organization of Securities Commissions
LBMA	London Bullion Market Association
LIBOR	London Interbank Offered Rate
MAR	Market Abuse Regulation
OP	Occasional Paper
PS	Policy Statement
RONIA	Repurchase Overnight Index Average
SONIA	Sterling Overnight Index Average
WM/R	World Markets/Reuters

Executive summary

Post-intervention evaluations inform our decision-making process

Evaluation is part of our Mission's decision-making framework. Testing the effectiveness of our remedies helps us make better decisions and add public value.

In April 2018, we published Discussion Paper 18/3 on our proposed framework for post-intervention impact evaluations. This is one of the ways we assess the impact of our interventions. Post-intervention impact evaluations differ from other approaches as they focus on quantifying the impact of our intervention. We intend to use them to assess the impact our interventions have had on consumers, firms and markets. We will feed them back into our decision making and how we best use our diagnostic and remedy tools.

This evaluation examines the effects of bringing additional benchmarks into the regulatory and supervisory regime in 2015, the Benchmarks (Amendment) Instrument 2015 (the Benchmarks Instrument 2015), by which we made amendments to the Handbook (notably in MAR and SUP) and guidance outside the Handbook in PERG.

Benchmarks – why use them and what has changed

Benchmarks are fundamental to the functioning of financial markets and widely used in both retail and wholesale markets. They are used to help set prices, measure performance, or work out amounts payable under financial contracts.

Following misconduct around benchmark failings, confidence in benchmarks and participation in the related markets were threatened. As part of a wider effort to restore market confidence and following recommendations from the Fair and Effective Markets Review (FEMR), the FCA brought the following seven benchmarks into the regulatory and supervisory regime in April 2015:

- Sterling Overnight Index Average (SONIA)
- Repurchase Overnight Index Average (RONIA)
- International Currency Exchange (ICE) Swap Rate (formerly ISDAFIX)
- World Markets/Reuters (WM/R) London 4pm Closing Spot Rate
- London Bullion Market Association (LBMA) Gold Price
- LBMA Silver Price
- ICE Brent Index

The Benchmarks Instrument 2015 aimed to improve the robustness of these benchmarks and restore market confidence by requiring benchmark administrators to:

- **become a regulated entity** and have FCA approved persons in key positions

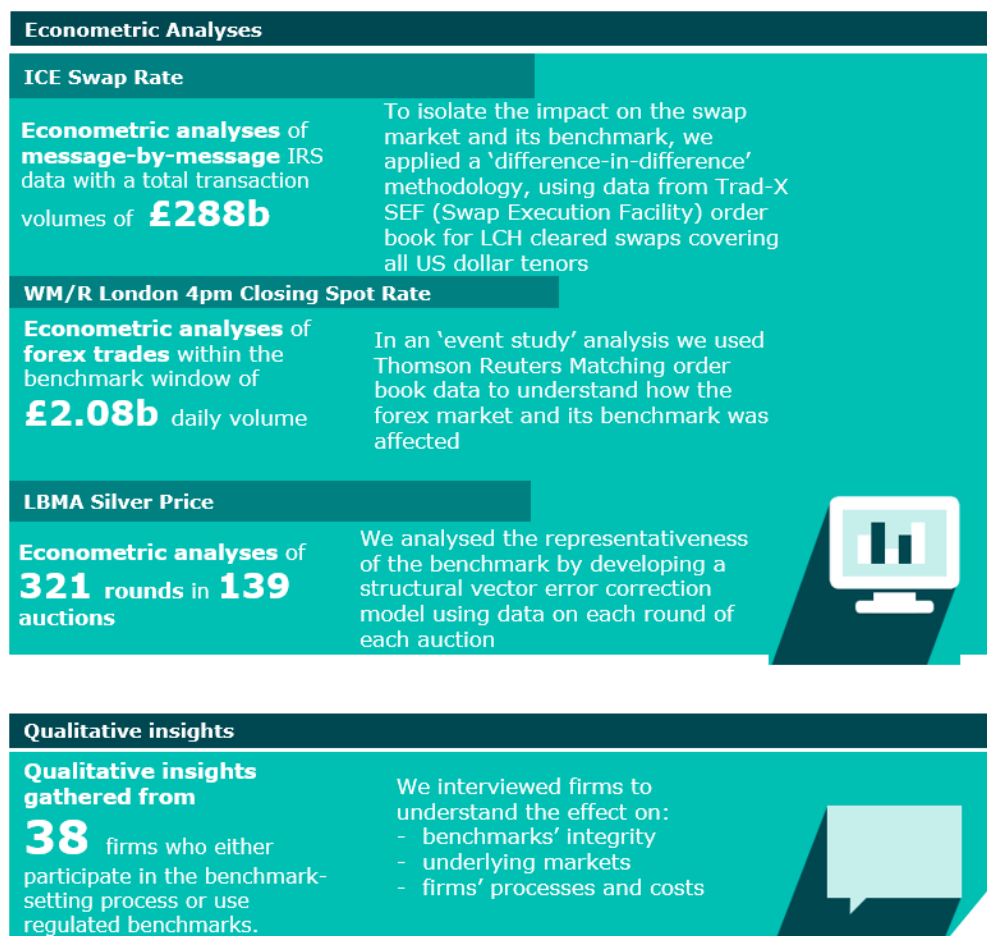
- **implement governance and oversight measures**, including establishing an oversight committee, and creating and maintaining practice standards
- **have record keeping and monitoring arrangements** for data and information used or made available to determine the benchmark, including arrangements to identify breaches of rules and potential suspicious activity
- **maintain sufficient financial resources**

We expected the intervention to make benchmarks more robust to manipulation and more representative of the underlying market. We also expected positive side effects on the underlying markets, such as liquidity improvements. We anticipated that the intervention would lead to higher operational costs for some firms.

We use qualitative and quantitative analyses to evaluate the impact of the intervention

We focus on quantifying the impact of the intervention by analysing transaction-level data of swap and forex markets, modelling bids and offers in the auction setting the LBMA Silver Price, and meeting with 38 different firms who either participate in the benchmark setting process or use regulated benchmarks. Figure 1 summarises the analyses.

Figure 1: A summary of our evaluation approach



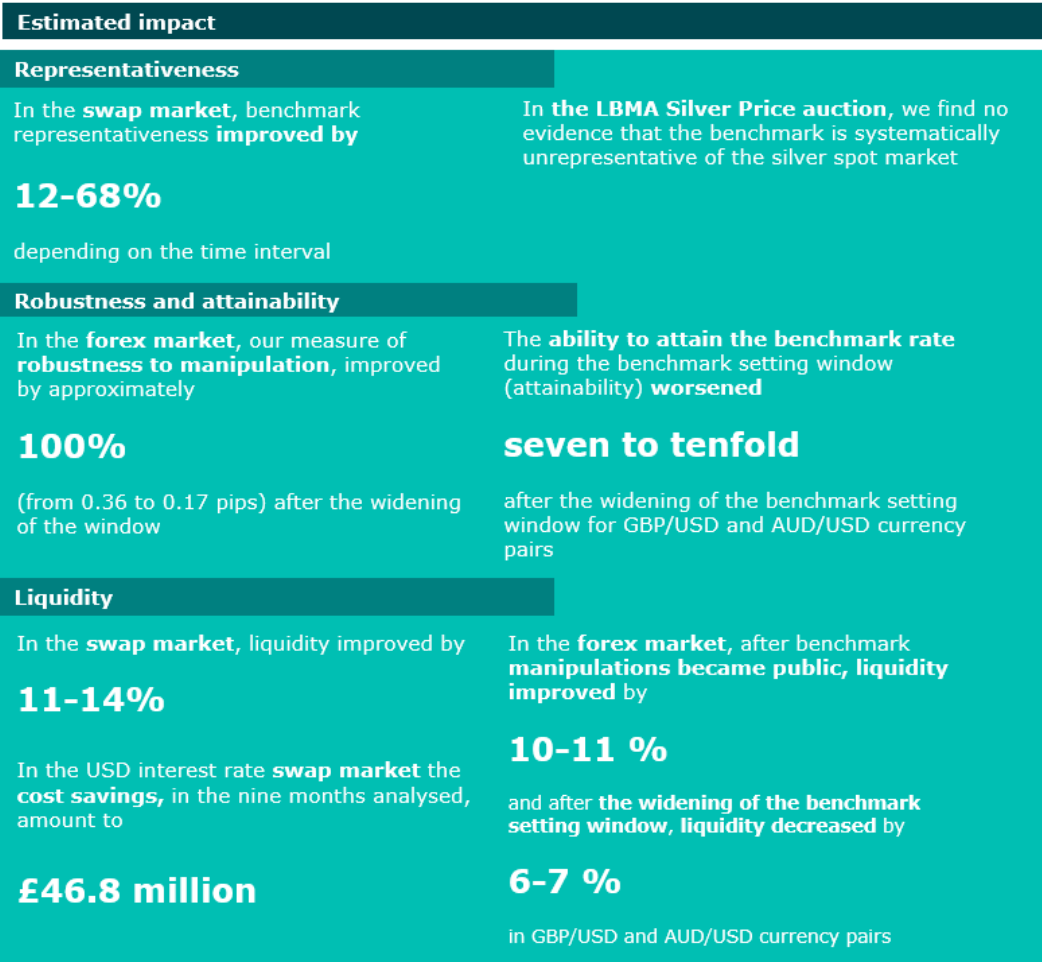
Source: FCA

The intervention has had a positive impact on benchmarks' robustness but the impact on market liquidity is mixed

Overall, we find that the Benchmarks Instrument 2015, together with other market developments (eg changes to benchmark methodologies), has had a positive impact on benchmarks' robustness, reassuring users. But the evidence on the underlying markets is mixed. Our findings suggest that the interventions were beneficial for already liquid markets. For less liquid markets, the perceived increase in regulatory risk may have contributed to a further reduction of the liquidity observed. This regulatory risk was driven by the added effect of fines, methodology changes, and our regulatory change.

In the swap market, the combination of the Benchmarks Instrument 2015 and change to the setting methodology have led to clear benefits. The Benchmarks Instrument 2015 on its own seemed to have had a negligible impact on the forex market and its benchmark, but there have been significant aggregate effects from the range of market and regulatory developments—particularly, the effects of news about collusion practices (June 2013) and the widening of the setting window from 1 to 5 minutes (February 2015). Figure 2 summarises our main findings.

Figure 2: A summary of our evaluation's main results



Source: FCA

Lessons learned

We view evaluations as an opportunity to learn from our previous interventions and feed any insights into our current and future work. The main lessons we learned from this evaluation are:

- The regulation of benchmarks is characterised by trade-offs. Policy changes may successfully improve robustness, making manipulation harder, but they can also worsen the ability to attain the benchmark rate during the benchmark setting window (attainability).
- While our rules improved the robustness of the benchmarks, they may have reduced liquidity and participation levels in markets where these levels were already low. From stakeholder interviews, the reason for worsened liquidity was a perceived higher regulatory risk of market participants. This regulatory risk was driven by the added effect of fines, methodology changes, and our regulatory change. Market driven initiatives, eg the introduction of clearing facilities in the LBMA Gold and Silver auctions, and our past discussions with stakeholders should help address these issues.

1 Why we are evaluating the seven additional benchmarks

The importance of benchmarks and their use

Benchmarks are fundamental to the functioning of financial markets and widely used in both retail and wholesale markets. They are used to set prices, measure performance, or work out amounts payable under financial contracts – this makes them integral to our strategic objective of ensuring that markets function well.

Our stakeholders mentioned the following uses for the seven benchmarks that were brought into the regulatory regime:

- **Sonia** to hedge against interest rate variations and as a reference rate (eg overnight cash, floating and cash-flow rates) in portfolios, funds and swaptions (options to enter a swap) such as options on Constant Maturity Swaps (CMS) and Constant Maturity Treasury (CMT) swaps.
- **ICE Swap Rate** to hedge contracts and value cash-settled swaptions, exchange traded swaps, and several other financial contracts (CMS, CMT, etc.).
- **WM/R 4 pm Closing Sport Rate** to harmonize the valuation of multi-currency portfolios and funds; to evaluate the difference between the performance of a portfolio or fund and its reference index (the tracking error); to execute foreign exchange transactions; and to provide a reference rate in financial contracts and cash-settlements.
- **LBMA Gold and Silver Price** to hedge exposures to gold and silver price fluctuations, and provide a reference price in trading activities and financial products, such as exchange-traded products.
- **ICE Brent Index** to settle the ICE Brent Futures contract on expiry day. The chemical composition and the quality of crude oils vary among and within geographical regions. Benchmarks allow the market to price physical oil and related products and provide reference prices for valuing and settling derivative contracts. ICE Futures Europe is the only exchange user of the benchmark.
- None of the stakeholders we met used **RONIA**. Two participants tried introducing products based on RONIA but there was no demand.

Existing users are unlikely to switch to alternative benchmarks, while new users have an incentive to adhere to the existing benchmarks because:

- The costs of replacing a benchmark are potentially high – for example, firms face costs of replacing their existing derivative contracts with new ones referencing an alternative benchmark.
- There are network effects – additional to the transaction costs of setting up new contracts, contracts referencing alternative benchmarks may not be widely available or only at a higher cost.

These costs and network effects make it difficult for a single firm to abandon a benchmark even if its integrity is compromised. For these reasons, a regulation aimed at improving benchmarks' integrity (ie robustness to manipulation and representativeness of the underlying market) can be beneficial.

Bringing benchmarks into the regulatory regime

Historically benchmarks were not regulated, but misconduct and manipulation cases threatened market stability and prompted the FCA's interventions (eg in 2014 [the fines for benchmarks manipulation](#) added up to £1.1bn). We now set out the chain of events that led to the Benchmarks Instrument 2015.

In June 2012, following a three-year investigation, the Financial Services Authority (FSA) – our predecessor organisation – announced findings against Barclays for misconduct in setting LIBOR.

In response to these findings, the Government asked Martin Wheatley to establish an independent review of the LIBOR system (the Wheatley Review). [The review recommended](#) that the FCA started regulating LIBOR which, in April 2013, became the first regulated benchmark.

The LIBOR scandal and the Wheatley Review brought global attention to financial benchmarks. The G20's finance task force and the Financial Stability Board (FSB) took on a review of benchmarks reforms. Consequently, in July 2013, the International Organization of Securities Commissions (IOSCO) [published a framework of 19 principles for benchmarks](#), which cover:

- governance (eg management of conflicts of interest)
- quality of the benchmark (eg data quality)
- quality of the methodology (eg the calculation methodology)
- accountability (eg auditing)

In June 2013, the European Securities and Markets Authority (ESMA) and the European Banking Authority (EBA) also published the [ESMA-EBA Principles for Benchmark Setting](#) in the EU, which aimed to mitigate governance and incentive issues affecting benchmarks.

After further conduct investigations and enforcement cases of manipulation, including for the LBMA Gold Price and the WM/R London 4pm fix, the Chancellor established the Fair and Effective Markets Review (FEMR) to restore confidence in the markets.

The FEMR recommended that the Treasury should extend the existing regulatory regime designed for LIBOR and bring the seven additional benchmarks into the FCA's regulatory regime.

The FEMR also recommended that general principles should be identified that are valid for all seven benchmarks instead of tailoring the rules to each of them specifically. The advantage of this approach was a swift implementation of the regulation into different markets, which was crucial given the emerging cases of misconduct.

The Treasury welcomed the recommendations and, following a period of consultation, the FCA published the Benchmarks Instrument 2015. The changes came into force on 1 April 2015.

Overall, the rules set out in the Benchmarks Instrument 2015 require benchmark administrators to:

- become a regulated entity and have FCA approved persons in key positions
- implement effective governance and oversight measures, including the establishment of an oversight committee and the creation and maintenance of practice standards
- have effective arrangements in place for i) monitoring the benchmark ii) record keeping of data and information used or made available to determine the benchmark iii) identifying breaches of rules and potential suspicious activity
- maintain sufficient financial resources

By introducing these requirements, our rules aimed to improve benchmarks' integrity. Regulatory interventions other than the Benchmarks Instrument 2015, together with market pressures, also prompted changes which improved benchmarks' integrity. We review those interventions and developments in the next chapter.

The evaluation and its aims

As stated in our Mission, evaluation is a critical part of getting our interventions right. Finding out what impact past interventions have had helps develop a strong evidence base to guide our decisions. These decisions can include which issues to prioritise and how best to intervene to tackle harm.

We published a proposed framework outlining the way we measure the causal impact of our interventions in April 2015. The framework explains:

- why we do post-intervention impact evaluations
- how we choose specific interventions to study
- how we ensure that our evaluations are robust, impartial, and, therefore, credible

This report follows the proposed approach to post-intervention impact evaluations, and is one of three pilot evaluations. The aim of this work is to understand:

1. the impact of the Benchmarks Instrument 2015 on markets and firms' costs and
2. whether the intervention met its objective of increased benchmarks' robustness, restoring market confidence

We do this by focussing on the main changes that we expected to see after the intervention.

Report structure

- Section 2 sets out an economic framework for this evaluation
- Section 3 summarizes the overall findings of our evaluation and provides a detailed analysis for each benchmark
- Section 4 concludes with the main lessons we have learned from this evaluation

2 Approach to the evaluation

Scope of our evaluation

The focus of this evaluation are the consequences of the changes to the FCA Handbook. To include the benchmarks in our regulatory regime, the Benchmarks Instrument 2015 modified Chapter 8 of the Market Abuse Regulation (MAR 8) as set out in the Policy Statement, [Bringing additional benchmarks into the regulatory and supervisory regime](#).

In this evaluation, we do not cover the changes due to other policies, such as:

- FCA supervisory work, enforcement cases, and principles set by IOSCO, ESMA and EBA
- The Policy Statement [Fair, reasonable and non-discriminatory access to regulated benchmarks](#) and the [EU Benchmark Regulation](#)

Our evaluation also does not include the London Interbank Offered Rate (LIBOR), because we were already regulating LIBOR at the time of the Benchmarks Instrument 2015, and because the benchmarks evaluated in this work are based on actual trades, while LIBOR is based on a survey from a panel of banks.

The choice of the benchmarks brought into the FCA regulatory perimeter was for the Treasury and beyond the scope of the modifications to the FCA Handbook. We have therefore focused in this report on the impact of the changes in regulation and not on the choice of benchmarks.

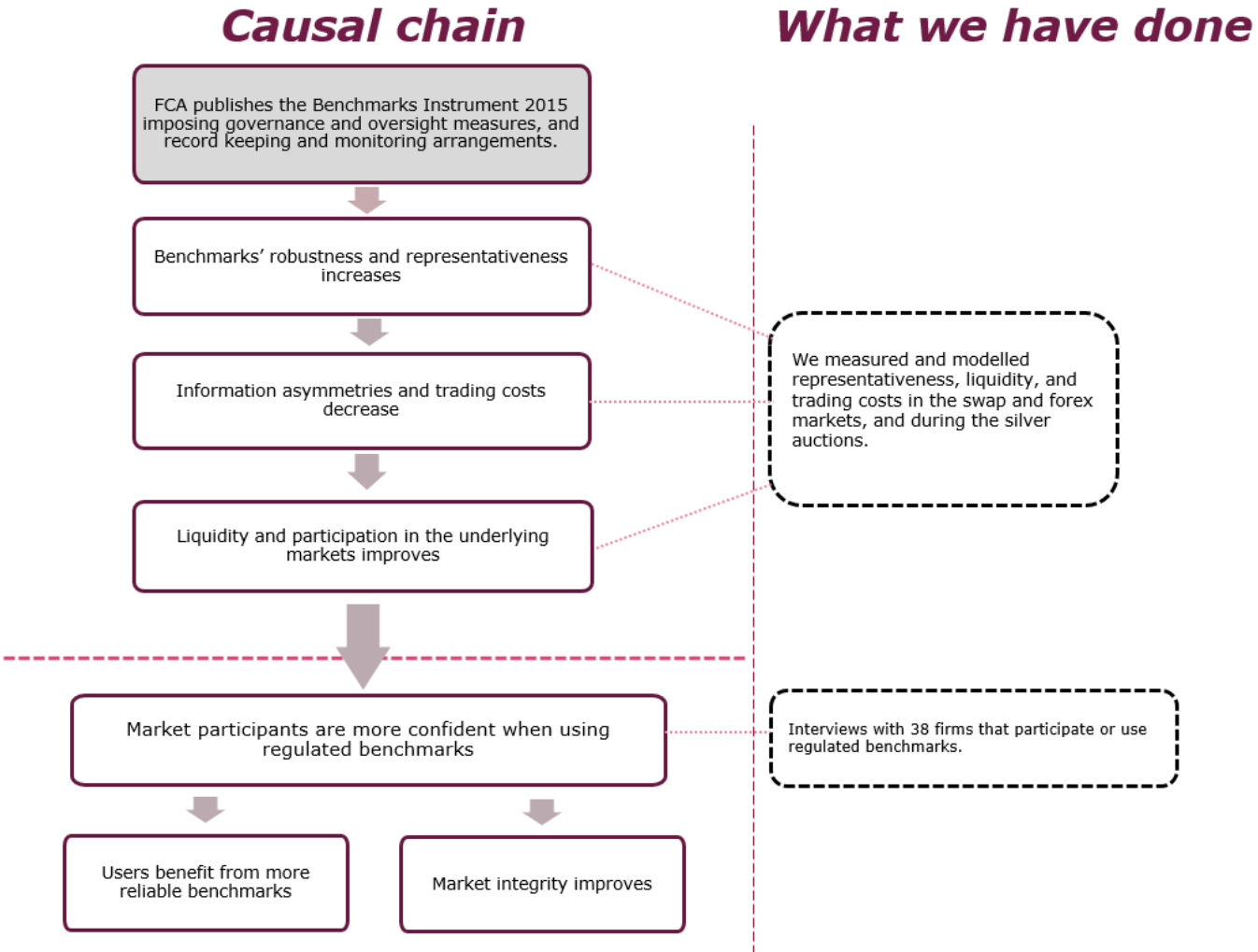
The expected outcomes from the intervention

A causal chain describes the mechanisms by which an intervention addresses the identified market failure and reduces harm, leading to costs and benefits. Figure 3 sets out a causal chain of the expected impacts arising from the Benchmarks Instrument 2015, linking intermediate and final outcomes with the intervention.

From a theoretical perspective (see our [research note](#) on the topic), benchmarks should help in improving underlying markets by reducing transaction costs and increasing liquidity. Without robust and representative benchmarks, informed dealers may take advantage of information asymmetries at the expense of uninformed traders. Benchmarks mitigate these information asymmetries, and an increase of transparency in the benchmark setting can reduce trading costs for less informed market participants. Because of the lower trading costs, we should expect more participation and hence increased market liquidity.

Overall, more reliable benchmarks restore confidence, improve the integrity of financial markets, and lead to better financial products.

Figure 3: Outcomes from this intervention



Source: FCA

Isolating the impact of our intervention is difficult given the extent of changes in the market

Around the time of our intervention, benchmark administrators implemented many other changes to setting methodologies. Market pressures and FEMR recommendations led to these changes, which include:

- In 2014, LBMA changed the price-setting process for the **LBMA Gold and Silver Price** to an electronic-based auction. In 2017, ICE, the new benchmark administrator, enabled central clearing facilities for both benchmarks.
- In February 2015, WM/R widened the calculation window of the **London 4pm Closing Spot Rate** from 1 minute to 5 minutes and began incorporating price feeds and transaction data from a broader range of sources. The FSB recommended these changes in its 2014 Final Report on Foreign Exchange Benchmarks.

- In April 2015, the **ICE Swap Rate** shifted from a submission-based methodology using inputs from a panel of banks to one based on tradeable quotes, where the quotes come from regulated electronic trading venues.
- In June 2016, the Wholesale Markets Brokers' Association (WMBA) extended the qualifying transactions for **SONIA and RONIA** from 16:15 to 18:00 UK time. The publication time for both benchmarks changed to 18:30 UK time. In April 2018, the Bank of England became the new benchmark administrator for SONIA and implemented further reforms, such as a broader coverage of the benchmark, a new methodology and publication time.
- The **ICE Brent Index** is the only benchmark that did not change its methodology since the introduction of our regulation. But, the administrator will amend the calculation of the ICE Brent starting with the expiry of the November 2018 ICE Brent Futures Contract (28 September 2018).

Altogether, these changes limit our ability to identify the effects due only to our regulatory intervention. Also, stakeholders often could not separate the impact of our rules from those of other interventions. They considered the Benchmarks Instrument 2015 as one element of the overall effort to address the concerns associated with benchmarks.

For these reasons, in our empirical analyses we often evaluate the joint impact of our rules and other interventions. In each case we state clearly which other intervention may have influenced the observed outcomes.

Information and data sources

To inform the evaluation, we gathered a wide range of evidence from a variety of sources:

- Order book data from Trad-X SEF for LCH cleared swaps, covering all USD tenors
- Order book data from Thomson Reuters Matching for forex trades
- Data on 321 rounds in 139 auctions setting the LBMA Silver Price
- Interviews with banks

Methods used to evaluate the intervention

We have used different methodological approaches and data to test the pre-intervention expectations in Figure 3. We now explain these methods.

Econometric analysis

Our quantitative analysis focuses on three benchmarks: the ICE Swap Rate, the WM/R London 4pm Closing Spot rate and the LBMA Silver Price, together with a theoretical model analysing the economic rationale behind regulating financial benchmarks. We have not quantitatively analysed the impact on:

- SONIA, as the Bank of England extensively analysed the benchmark and implemented various reforms

- the LBMA Gold Price, since we analysed the LBMA Silver Price which has an analogous setting methodology with similar vulnerabilities
- Ronia and the ICE Brent Index, as they are less important in terms of their number of users

We did not assess firms' compliance with the Benchmarks Instrument 2015. Instead, we assessed the consequences of the regulatory change on benchmarks' integrity, underlying markets, and firms' businesses. To assess these changes, we used the following statistical methods.

Difference-in-Difference

To identify the impact of the changes on the swap market, we use a difference-in-difference model. We compare the swap market before and after the change of methodology and the introduction of the regulation, using tenures unaffected by the interventions as a control group.

Event-study

To identify the impact on the forex market, we follow an event study methodology. We examine how market quality was affected by the revelation of news about collusion in the forex market, and by the widening of the benchmark window from 1 minute to 5 minutes.

Structural Vector Error Correction model

Volumes influence prices. In turn, prices influence volumes. To model this relationship during the LBMA Silver Price auctions, we develop a structural vector error correction model.

Firm interviews

We complement the econometric analyses with insights from interviews with 38 different firms who either participate in the benchmark setting process or use the regulated benchmarks. These firms include benchmark administrators, electronic platforms, brokers, banks, investment managers, custodians, Central Counterparty Clearing Houses (CCPs) and commodity trading firms and dealers.

We sought firms' views on the consequences of the Benchmarks Instrument 2015, including the effects on:

- Benchmarks' integrity (ie their robustness to manipulation and representativeness of the underlying market)
- underlying markets and other related markets
- firms' processes and costs

3 Evaluation findings

Section summary

Overall, we find that the Benchmarks Instrument 2015, together with other market developments (eg changes to benchmark methodologies), has had a positive impact on benchmarks' robustness, reassuring users. But the evidence on the underlying markets is mixed. Our findings suggest that the interventions were beneficial for already liquid markets. For less liquid markets, the perceived increase in regulatory risk may have contributed to a further reduction of the liquidity observed.

The main findings of the qualitative and quantitative analysis are summarized first in this chapter, followed by a more detailed analysis for each benchmark.

Benchmark integrity improved

Most stakeholders believed that the Benchmarks Instrument 2015 made benchmarks **more robust to manipulation and more representative of the underlying market, reassuring users** about the integrity of the benchmarks.

The FCA's intervention increased firms' awareness of integrity problems by focusing firms' internal discussions and resources on conflicts of interests around the benchmark activities. The intervention also reinforced market standards and harmonised (and made permanent) the application of FSB and IOSCO recommendations.

For most stakeholders, the Benchmarks Instrument 2015 drove the improvements mainly through the introduction of checks on the data used to determine a benchmark and through the oversight committees (which periodically review the methodologies). But some believed that the enforcement cases, the changes in the benchmarks' design and the interventions following the LIBOR misconduct cases were more important than the benchmark regulation.

The Benchmarks Instrument 2015 may also have had **positive side effects** on the integrity of non-regulated benchmarks. We learned that, as firms had to implement new controls for the regulated benchmarks, most of them extended the procedures to non-regulated ones.

The evidence on the underlying markets is mixed

While firms had not done any formal analysis, we received consistent anecdotal feedback that our rules had no effect on already liquid markets and worsened the liquidity of markets with few participants and an already low level of liquidity. The reason given for

worsened liquidity was a perceived higher regulatory risk of market participants who feared that the revision of a submission may be perceived as an attempt of manipulation. This regulatory risk was driven by the added effect of fines, methodology changes, and our regulatory change.

To better understand the impact of the Benchmarks Instrument 2015 and to test this anecdotal feedback, we empirically analysed two major, liquid benchmarks – the ICE Swap Rate and the WM/R 4pm Closing Price – as well as a benchmark with few participants and low levels of liquidity – the LBMA Silver Price.

For the ICE Swap Rate, in [OP27](#), we analysed the change in the swap market from a panel-based to a market-based assessment and the simultaneous regulatory change. In contrast to the feedback received from the firms, our analyses suggest that swap markets' liquidity and trading costs improved after the regulatory and regime change: spreads narrowed by 11-14%, the depth of the order book increased by 4%, and the execution costs fell by 11%.

Similarly, for the WM/R London 4 pm Closing Spot Rate, in [OP46](#), we analysed the effects of reports of dealer collusion in the media and the widening of the setting window. We find that, after the revelation of collusion, liquidity improved by 10-11%; while after the methodology changed the robustness to manipulation increased by approximately 100%, but the liquidity in the window and the attainability of the benchmark worsened by 6-7% and seven- to tenfold respectively. So, the overall effect on liquidity of ceasing the collusion and widening the window is mixed.

For the LBMA Silver Price auction, as set out in our [research note](#), we received anecdotal feedback that auction participants may no longer allow clients to change orders during the auctions and that proprietary trading in the auctions reduced, presumably because of the perceived regulatory risk. It seems that this change of behaviour led to order imbalances during the auctions. However, our empirical analysis suggests that a temporary surge in order imbalances does not systematically compromise the representativeness of the LBMA Silver Price benchmark.

While we cannot clearly separate our interventions from other market developments, our findings suggest that **the interventions were beneficial for already liquid markets. For less liquid markets, the perceived increase in regulatory risk may have changed traders' behaviour**, partially contributing to a further reduction of the liquidity observed.

The incremental cost due to our regulation was in line with our estimates

Administrators, platforms and participants were already IOSCO compliant when we implemented the Benchmarks Instrument 2015. Firms had already incurred some costs, eg for monitoring and surveillance systems, before our intervention, and could not always quantify the costs only due to our regulatory changes.

Table 1 compares the expected costs with the feedback from firms. Since participants' feedback included costs due to other regulations, we consider **the costs of the Benchmarks Instrument 2015 to be broadly in line with the estimates** in CP14/32.

Firms’ assessment of the cost of our rules varied depending on whether the firm was an administrator, a platform or a participant. In CP14/32, we estimated for an administrator a total set-up cost between £0.55m and £1.14m and ongoing costs between £0.30m and £1m; for a ‘submitter’,¹ set-up costs between £0.93m and £1.44m and ongoing costs between £0.13m and £0.39m; for a user, we did not expect any costs.

Table 1: Comparison of CBA estimated costs and feedback on actual costs incurred

Role	CBA estimated costs	Feedback on actual costs incurred
Administrator	One-off: £0.55m-£1.14m	One-off: £0.12m-£1.57m
	Ongoing: £0.30m-£1m	Ongoing: -
Platform		One-off: £1m
	One-off: £0.93m-£1.44m	Ongoing: £0.1m
Participant	Ongoing: £0.13m-£0.39m	One-off: £0.08m-£2.7m
		Ongoing: £0.4m-£1.96m
Users	None	None

Firms’ feedback by role is:

- Most of the benchmark **administrators** had to enhance their monitoring and surveillance capabilities because of our rules. An important source of the incremental costs was the oversight committee with one-off set-up costs per benchmark ranging between £117,470 and £1.57m (estimates based on three firms) depending on the number of benchmarks administered.² Administrators mentioned that the main ongoing costs stem from the oversight committees and the monitoring requirements, but did not provide any figures.
- Most of the **platforms and information providers** did not incur material incremental costs. One firm estimated that enhanced surveillance and the new governance procedures led to one-off set-up costs of approximately £1m and ongoing costs of around £100,000 per year.
- Most **participants** considered the costs of the Benchmarks Instrument 2015 minimal. Three firms estimated their costs but cautioned that other interventions had led to

¹ In the original cost-benefit analysis in CP14/32, the term ‘submitter’ was used to describe a person providing information in relation to a specified benchmark, analogous to platforms and benchmark participants who also provide information in relation to benchmarks. We therefore use the cost estimates for ‘submitters’ as proxies for the costs to benchmark participants and platforms.

² Converted from USD at the rate of \$1 = £0.78. The same conversion rate has been applied to all figures that were provided in USD in this document.

those costs being incurred. Cost estimates varied depending on the firm and the number of benchmarks in which they participated—one-off set-up costs ranged from £78,313 to £2.7m; ongoing costs ranged between £0.4m and £1.96m.

- Two **users** mentioned they had observed increased data fees not justified by the improvements of the benchmarks. But most of the users did not experience a material increase in the costs of benchmarks feeds due to the Benchmarks Instrument 2015.

In addition to the costs above, participants raised some concerns about audit and surveillance costs, due to the Benchmarks Instrument 2015, for benchmarks which are not used (eg RONIA) or not always published (eg certain swap rate tenures).

The Benchmarks Instrument 2015 also reduced costs for some firms. One firm reported that the Benchmarks Instrument 2015 led to clearer rules, which decreased their compliance cost. And a few firms reported that they face lower compliance costs for the ICE Swap Rate under the new market-based methodology.

In addition, the Benchmarks Instrument 2015 served some benchmark administrators commercially by certifying the quality of their services. Some participants' business benefitted as using regulated benchmarks provided confidence to their clients.

Evaluation by benchmark

ICE Swap Rate

Stakeholders generally perceived the move of the ICE Swap Rate from a submission-based to a trade-based benchmark as very beneficial for the integrity of the benchmark and its underlying market. Our analysis in [OP27](#), published in 3 July 2017, supports these impressions.

In OP27, we analysed the main USD tenure (the 10Y tenor swap) for which the ICE Swap Rate is assessed on its main trading venue (Trad-X).

We used a [difference-in-difference](#) analysis to distinguish the effects due to the Benchmarks Instrument 2015 from other market events. Because the day the rules came into force coincided with the day the benchmark administrator changed the setting methodology, the following empirical results are the consequence of both interventions and they cannot be disentangled.

Overall, the regime and regulatory changes made the benchmark less vulnerable to manipulation, but made it rely on the data from three trading venues (Trad-X, BGC Trader and ICAP's i-Swap) only.

To understand whether the benchmark still represents the underlying market, we measured the gap between the benchmark rate and the average buy and sell price in the market around the benchmark assessment time. Despite the concerns about the data coming from three venues only, we find the changes improved the representativeness of the benchmark by 12%-68% depending on the time window used to estimate the difference.

Additionally, to understand the effects on the underlying market, we estimated liquidity and trading costs. We found that they improved after the regulatory change and the change of the setting methodology:

- Liquidity:
 - the average daily time-weighted spread decreased by 14% and the average daily time-weighted relative quoted spread dropped by 11%
 - the sum of the offer and bid volumes at the best 10 levels of the order book (the 10-level quoted depth) marginally increased by approximately 4%, even though quoted depth at the best bid and offer became thinner
- Trading costs: The roundtrip costs for completing a buy and sell transaction (the average daily fill spreads, which approximate the liquidity on both sides of the order book) decreased by 11%.

We can use the estimate of the roundtrip costs for the 10Y USD tenor on Trad-X to quantify the overall benefits of the change to regulation and methodology. Based on this estimate, cost savings for the USD tenures on Trad-X are £12.48m-£24.18m.³ Since we expect similar improvements on BGC Trader and ICAP's i-Swap (because of the links among the three trading platforms), we estimate that in the USD interest rate swap market, in the nine months analysed, the **overall cost savings plausibly amount to £46.8m.**⁴

Despite these encouraging findings, after the methodological and regulatory changes, **some benchmarks based on less liquid rates and tenors ceased to exist** (like the Swiss Franc) or have not been published because of the low liquidity levels and the lack of transactions. These issues marginally affected the business of two stakeholders that had to stop offering products related to these benchmarks. But these products were not a significant part of their business.

Overall, the change in methodology and regulation improved the representativeness of the benchmarks and the quality of the underlying market—a result in line with the theoretical predictions. The impact differed depending on the initial liquidity and depth of the market underlying the individual tenors.

WM/R London 4pm Closing Spot Rate

Stakeholders said that the use of the WM/R London 4pm Closing Spot Rate benchmark had increased thanks to improved macroeconomic conditions, trends towards passive investment, and the changes to the European Central Bank foreign exchange reference rates in 2015.

They believed the changes in methodology and FCA's regulatory intervention improved both the integrity and representativeness of the benchmark. But they had concerns about the predictability of the order flow during the setting window.

Market participants had become **more cautious with how the FCA could perceive their trading intentions**. Many moved to algorithmic trading to better manage the possible conflict of interests originating from human intervention; some spread their trades

³ Assuming that cost savings are similar for other tenors, we use the coefficients of the difference-in-difference regression, Equation 9, in OP27 and apply it to the respective volume and maturity of the other twelve tenors. The formula used is $\sum_c \frac{\beta_3}{100 \times 2} \times Vol_c \times Mat_c$, where: β_3 is the coefficient from Equation 9; Vol_c is the electronic volume traded in the USD IRS contract c (only consider post-BRC transactions); Mat_c is the maturity of the contract c ; divided by 100 because swap prices are quoted as a percentage rate; divided by 2 to indicate the cost savings of a one-directional trade.

⁴ On average Trad-X has a 50% market share across tenors in the D2D segment of the IRS market.

uniformly across the window. Market participants were also concerned that high frequency traders may try to anticipate and take advantage of flows.

The increased perception of regulatory risk, the recommendations to charge fees for trade executions, and the reduced attainability of the benchmark have created incentives for participants to net off their positions before the setting window opens.

Netting allows participants to obtain the mid-price and reduces several risks (eg legal, non-execution and price impact risk), but also reduces volumes and liquidity in the setting window. Yet, stakeholders still perceive the WM/R London 4pm Closing Spot Rate to be the most liquid benchmark. Our analysis supports this perception.

In OP46, published alongside this Evaluation Paper, we analyse the WM/R London 4pm Closing Spot Rate. We examined five currency pairs (AUD/USD, EUR/HUF, EUR/SEK, GBP/USD, EUR/USD) sourced from one of the main inter-dealer venues (Thomson Reuters Matching).

We applied an event-study approach to measuring the effects of news about collusion practices (12 June 2013) and the widening of the setting window from 1 to 5 minutes (15 February 2015) on representativeness, attainability and robustness of the benchmark. Our analysis suggests that these two events, both pre-dating the Benchmarks Instrument 2015, had the biggest impact and, consequently, the Benchmarks Instrument 2015 had a negligible effect. However, the reform of the forex market was the result of a long process that the Benchmarks Instrument 2015 contributed to.

To assess the representativeness of the benchmark, we measured by how much the benchmark rate deviated from the average price outside of the benchmark window (loosely speaking we calculated the standard deviation between the benchmark rate and the volume weighted average price). We found that neither the news about collusion practices nor the widening of the benchmark setting window had no effect on representativeness.

Prices systematically changing after the setting may indicate that the benchmark poorly represents the market. Therefore, to assess the representativeness of the benchmark, we also measured how much prices changed around the benchmark setting window (loosely speaking we analysed price reversals, ie short-term movements in the direction opposite to the main trend). We found that these corrections disappear after the widening of the window, meaning that this measure of representativeness of the benchmark improved.

To measure attainability, we calculated the difference between the benchmark rate and the average price within the benchmark window (we estimated the root mean square error of the tracking error against the volume-weighted average transaction price within the fixing window). Our estimates suggest that, after the widening of the benchmark setting window, attainability worsened seven- to tenfold for GBP/USD and AUD/USD currency pairs respectively.

We examined robustness by simulating the effect that outlier trades, which can be interpreted as attempts of manipulation, would have on the benchmark rate. By widening the benchmark window, the effect of outliers on the benchmark rate is reduced. We estimate that robustness improved by around 100% after the widening of the window, but this effect is economically insignificant.

The effect on liquidity is mixed. Liquidity of the underlying market improved by 10-11% following the news of collusion, presumably because of a reduction of information asymmetries related to market abuse—a result in line with the theoretical predictions. In contrast, the subsequent window widening worsened liquidity by 6-7%.

Overall, we found that **liquidity improved after the news about collusion practices** (by 10-11%); while **attainability and liquidity decreased while robustness increased after the widening of the window** (seven- to tenfold, 6-7%, 100% respectively). One measure of representativeness also improved after the widening of the window. The Benchmarks Instrument 2015 on its own seemed to have had a negligible impact on the forex market and its benchmark.

LBMA GOLD and SILVER

Most stakeholders considered the previous LBMA Gold and Silver regime opaque. They perceived that the move to an electronic platform increased transparency and decreased the risk of manipulation for the LBMA Gold and Silver price.

Market pressures led to the introduction of electronic platform-based auctions, which took effect before the Benchmarks Instrument 2015 (in 2014), suggesting that the Benchmarks Instrument 2015 had little direct impact on the integrity of these benchmarks.

Many firms mentioned that, after the Benchmarks Instrument 2015, auction participants no longer allowed their clients to change orders during the auctions, reduced their proprietary trading and use of arbitrage strategies. Some firms claimed that this **change of behaviour during the auctions was due to a perceived increase in regulatory risk**.

Stakeholders claimed that this change of behaviour worsened liquidity provisions, leading to temporary imbalances during the auctions. Consequently, concerns rose about differences between auction and silver spot prices, questioning the representativeness of the benchmarks. For example, on April 10, 2017 the auction started with a 0.008% difference between the two prices. The difference progressively increased to 0.8% during the auction. Eventually, the auction got suspended for several minutes.

To better understand the effects of the imbalances on the auctions, we analysed the LBMA Silver Price empirically. This analysis is set out in a research note published alongside this Evaluation Paper.

We develop a structural vector error correction model to examine the relationship between spot market prices, auction prices, and aggregated bids and offers for each round in every auction over the period March to September 2017. Our dataset only spans the period after the shift to an electronic platform and the Benchmarks Instrument 2015, so we could not assess whether the imbalances are due to these two interventions nor whether representativeness deteriorated.

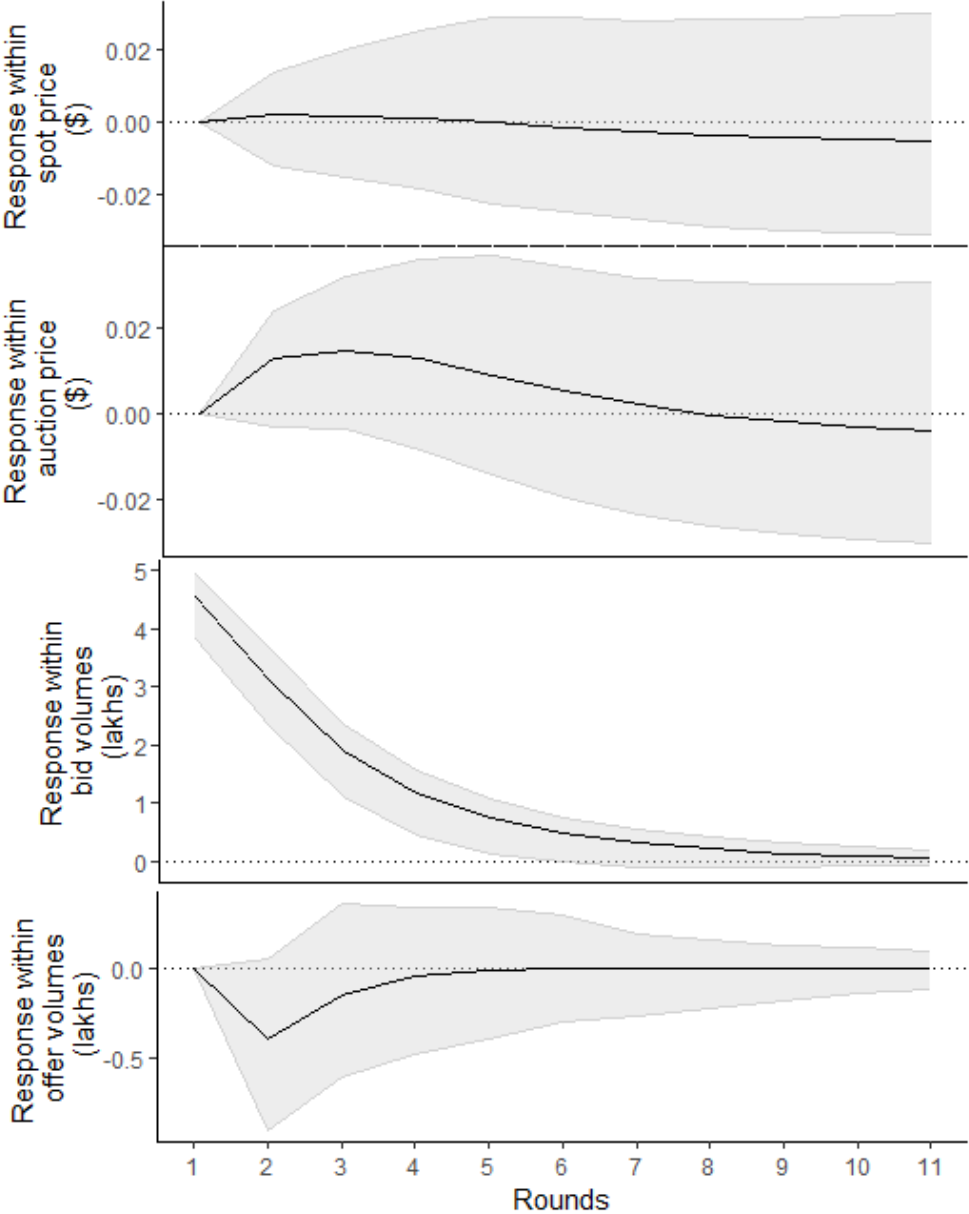
We use the model to simulate an increase in bid volumes and so in order imbalances (Figure 4). We find offer volumes do not adjust to a surge in bid volumes—in line with stakeholders' claims on the imbalances. However, the figure also shows that bids do adjust and progressively reduce. And the auction price converges towards the spot one as bids decrease.

So, our analysis suggests that auction participants react to differences in auction and spot market prices. Even if only one side of the market may revise its quotes, the revision permits the auction price to integrate the information from the spot market.

After the period analysed, in October 2017, the new administrator, ICE, introduced clearing facilities, reviewed the setting process, and the number of participants increased. These

further steps from the new administrator and past FCA discussions with stakeholders should help in reducing the risk of future dislocations.

Figure 4: Dynamics of the auction setting the LBMA Silver Price after a shock to bids volumes in round 1. The grey area represents the 95% confidence interval.



Source: FCA

SONIA and RONIA

Stakeholders perceived SONIA as one of the most robust benchmarks in the market because it is based on traceable transactions. In their views, enormous trading volumes would be required to manipulate the benchmark.

Firms had some concerns about how well the benchmark represents the underlying market, as SONIA only includes transactions arranged via brokers. But the Bank of England implemented reforms broadening the value of transactions underpinning SONIA from less than £15bn to an average of £50 billion per day. Participants welcomed these reforms and expect them to make SONIA more representative of the market.

Stakeholders did not perceive that our regulation has had an impact on the liquidity of SONIA's and RONIA's underlying markets. One firm stated that, based on their assessments, trading volumes had remained stable over the medium-to-long term. A couple of firms mentioned that balance sheet restrictions due to other regulations, but not the Benchmarks Instrument 2015, caused the major impact on the market liquidity.

ICE Brent Index

We didn't receive any feedback on ICE Brent Index from the stakeholders as none of them was using the benchmark.

Yet, academic studies have shown that having representative and reliable oil benchmarks facilitates the price discovery process between physical and future oil markets, enhancing their liquidity.⁵

⁵ Frino, A., G. Ibikunle, V. Mollica and T. Steffen (2017). The Impact of Commodity Benchmarks on Derivatives Markets: The Case of the Dated Brent Assessment, *Journal of Banking and Finance*.

4 Lessons learned

The lessons learned from this evaluation are a function of the intervention in this specific market. Our lessons here may not read across directly to, for example, a similar intervention in another market. Nevertheless, they provide useful insight in helping us anticipate potential ways of reducing harm and the likely impact in doing so. Table 2 sets out our main lessons learned.

Table 2: Main lessons learned from our evaluation

#	Lesson learned	Comments
1	Benchmarks’ robustness improved but at a price	The regulation of benchmarks is characterised by trade-offs. While changes can successfully improve the robustness, making manipulation harder, they can also make it more difficult for investors to attain the benchmark. We found evidence for this especially in forex benchmarks.
2	Perceived regulatory risk may lead to unintended consequences, especially in markets with low liquidity and participation	While our rules improved the robustness of the benchmarks, they may have reduced liquidity and participation levels in markets where these levels were already low, eg in the LBMA Silver Price auctions, for some swap tenures, and for some currencies in the forex market. From stakeholder interviews, the reason given for worsened liquidity was a perceived higher regulatory risk of market participants. This regulatory risk was driven by the added effect of fines, methodology changes, and our regulatory change. Market driven initiatives, eg the introduction of clearing facilities in the LBMA Gold and Silver auctions, and our past discussions with stakeholders should help address these issues.

