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Competition Analysis of the Implications for
Financial Stability and Monetary Policy**

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The Disruption of Retail Banking: A Competition Analysis of the Implications for Financial Stability and Monetary Policy

Paolo Siciliani[†]

ABSTRACT

This article analyses the competition impact of the implementation of two recent regulatory reforms aimed at boosting competition in retail banking by reducing consumer search and switching costs and empowering different business models whereby non-bank operators are able to compete with banks with respect to specific activities such as the provision of payment services. The article investigates how banks may react strategically in order to fend off the resulting competition threats, which promise to undermine retail banks' reliance on the supply of sight retail deposits as their main source of funding. It also explores how financial regulators, in particular micro and macro prudential authorities, should respond, mindful of the risk for unintended consequences.

I. INTRODUCTION

Retail banking in the UK is undergoing profound changes partly as a result of regulatory interventions such as Open Banking,¹ a remedy imposed by the Competition and Markets Authority (CMA) which came into force in January 2018 with the aim of making it easier for consumers (including small and medium enterprises - SMEs) to compare alternative offers for their personal / business current account (PCA / BCA).² Specifically, the CMA required the six largest incumbent deposit-taking institutions (hereafter: banks) to adopt a common standard technological solutions labelled application programming interfaces (APIs) through which they

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¹ See <<https://www.openbanking.org.uk/>>.

² Hereafter, we simply refer to consumers and PCAs.

will share data with other smaller deposit-taking institutions and with third party service providers including price comparison websites (PCWs), account information service providers (AISPs) and payment initiation service providers (PISPs).³ The last two types of service providers were introduced under the revised EU Payment Services Directive (PSD2)⁴ which also came into force in January 2018 (as transposed into UK law with the Payment Services Regulations – PSR - 2017) with the same kind of access remedy in favour of third-parties.⁵ AISPs, labelled ‘aggregators’, allow consumers to monitor more than one account held with different banks via a single online application. PISPs allow consumers to seamlessly instruct their bank to make a payment directly from third-party online applications.⁶ Open Banking is circumscribed to PCAs, whereas PSD2 apply to any payment account, thus also including online saving accounts and credit card accounts. After an exchange of opinions with the

³ See Competition and Markets Authority (CMA), Retail Banking market investigation – Final report, August 2016 <<https://assets.publishing.service.gov.uk/media/57ac9667e5274a0f6c00007a/retail-banking-market-investigation-full-final-report.pdf>>, para. 13.5.

⁴ Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC [hereafter: PSD2] Articles 4(15) and 4(16) [2015] OJ L 337/58.

⁵ Payment Services Regulations 2017, SI 2017/752. See also HM Treasury and Financial Conduct Authority (FCA), Expectations for the third party access provisions in Payment Services Directive II, July 2017 <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630135/Expectations_for_the_third_party_access_provisions_in_PSDII.pdf>.

⁶ See FCA, New regulated payment services: Account Information Services (AIS) and Payment Initiation Services (PIS), 02 February 2017 <<https://www.fca.org.uk/firms/new-regulated-payment-services-ais-pis>>.

European Banking Authority, the European Commission endorsed the adoption of APIs under the PSD2.⁷

Another potentially impactful intervention is the Bank of England's decision to provide access to its real-time-gross-settlement (RTGS) system to non-bank payment service providers (NBPSPs),⁸ including e-money institutions such as PayPal,⁹ so that they have the option to get access to the main sterling payment platforms without relying on an agent bank. As a result, NBPSPs authorised by the Financial Conduct Authority (FCA) under the PSR 2017 can choose to gain greater control over their payment activity, thanks to the fact that they will no longer have to partner with a direct competitor for access to essential payment infrastructures.

⁷ See European Commission, Payment Services Directive (PSD2): Regulatory Technical Standards (RTS) enabling consumers to benefit from safer and more innovative electronic payments, 27 November 2017 <[http://europa.eu/rapid/press-release MEMO-17-4961_en.htm](http://europa.eu/rapid/press-release_MEMO-17-4961_en.htm)>. See also Letter from Olivier Guersent COM replying to the EBA Letter on RTS on SCA and CSC, 13 February 2018 <<https://www.eba.europa.eu/documents/10180/2101654/Letter+from+Olivier+Guersent+COM+replying+to+the+EBA+Letter+on+RTS+on+SCA+and+CSC+-+13022018.pdf/faf94000-a982-4ef2-84f5-d1dc3e5a30ee>>.

⁸ See Bank of England, Bank of England extends direct access to RTGS accounts to non-bank payment service providers, 19 July 2017 <<https://www.bankofengland.co.uk/news/2017/july/boe-extends-direct-access-to-rtgs-accounts-to-non-bank-payment-service-providers>>. In April 2018, the currency exchange app Transferwise was the first NBPSP to gain access to the Bank of England's RTGS: see Bank of England, 'First non-bank payment service provider (PSP) directly accesses UK payment system', 18 April 2018 <<https://www.bankofengland.co.uk/-/media/boe/files/news/2018/april/first-non-bank-bsp-directly-accesses-uk-payment-system.pdf?la=en&hash=8531C7C737072413BC234D8331637E5518BFA4C2>>.

⁹ Electronic money (e-money) is a digital alternative to cash. It allows users to make cashless payments with money stored on a card or a phone, or over the internet <https://ec.europa.eu/info/business-economy-euro/banking-and-finance/servizi-finanziari-ai-consumatori-e-pagamenti/payment-services/e-money_en>.

This article explores the potential implications of these two reforms, in particular the extent to which the mainstream model of retail banking might be disrupted and how the regulatory community may respond to those challenges. For example, with respect to the implementation of PSD2, the CEO of the largest European banking group voiced her concern that banks will be at a competitive disadvantage against internet giants such as Google, Amazon, Facebook and Apple (collectively labelled as GAFAs)¹⁰ were they to decide to offer payment initiation or ‘aggregator’ services.¹¹ The UK is a frontrunner in both the implementation, under the Open Banking initiative,¹² of a common API standard to allow AISPs and PIPs to seamlessly link into banks’ online banking platforms and the provision of RTGS access to NBSPs.¹³ Prudential regulators, at both the macro and micro level, would have to react to the disruption of the mainstream model of retail banking in order to preserve the safety and soundness of banks and financial stability overall during what would be a period of paradigmatic transition.¹⁴ In addition, from a monetary policy standpoint, the supply of credit and the monetary transmission mechanism might also be impaired.

¹⁰ There also is an acronym covering Chinese equivalents: Baidu, Alibaba and Tencent (BAT).

¹¹ See Nicholas Megaw and Rochelle Toplensky, ‘Santander chair calls EU rules on payments unfair’ *Financial Times* (London, 17 May 2014) <<https://www.ft.com/content/d9f819f2-3f39-11e8-b7e0-52972418fec4>>.

¹² See Ian King, ‘Open Banking: Britain’s gigantic financial experiment’ *Sky News* (London, 12 January 2018) <<https://news.sky.com/story/open-banking-britains-gigantic-financial-experiment-11204816>>.

¹³ As far as we are aware, the only other central bank that provide RTGS access to NBSPs is the Bank of Lithuania: see Beginning of a new era: Bank of Lithuania enables real-time payments through CENTROLINK, 21 November 2017 <<https://www.lb.lt/en/news/beginning-of-a-new-era-bank-of-lithuania-enables-real-time-payments-through-centrolink>>.

¹⁴ See, in this respect, Alex Brazier, ‘Five years of macro-prudential: Regulating the Square Mile for all 94,000 square miles’, 19 April 2018 <<https://www.bankofengland.co.uk/-/media/boe/files/speech/2018/alex-brazier->

The main result is that the implementation of Open Banking (and PSD2) might undermine retail banking by calling into question the traditional reliance on sight retail deposits as a relatively cheap and stable source of funding. Nevertheless, banks might find ways to adapt to the fact that consumers become more prone to move their deposit balances in order to improve their remuneration. Therefore, it would be too hasty to intervene ex-ante by changing the categorisation of insured sight retail deposit under liquidity adequacy rules. Furthermore, in case intervention was needed, in order to prevent systemic contagion due to a price war among banks worried about being subjected to an outflow of deposits, the best approach may be for the central bank to provide an alternative source of funding by setting up a lending facility scheme of the type used for monetary policy. Allowing NBPSPs to access RTGS might have the unintended consequence of enabling a potentially more disruptive competition threat to retail banking, something that could prove to be as impactful as the provision of universal access to the central bank's balance sheet. Perhaps counterintuitively, banks' strategic reaction aimed at foreclosing NBPSPs might push the latter to offer a fully-fledged substitute for a bank current account. The resulting disintermediation threat might have far reaching implications not only for financial stability, but also for the supply of credit to the real economy. Ultimately, the combined result of these two reforms may be to expand the role of the central bank in the direction of financial intermediation.

The next section outlines the main rationales underpinning the two regulatory reforms. Section III delves into the likely challenges for the mainstream retail banking business model, whilst section IV explores how financial regulators may foreseeably react. Section V concludes.

II. THE CASE FOR INTERVENTION

[imperial-college-future-of-finance-conference.pdf?la=en&hash=4A08ED04F52583A9F206AB8725E4E2971756C7F3](https://www.imperial.ac.uk/media/imperial-college/future-of-finance-conference/pdf?la=en&hash=4A08ED04F52583A9F206AB8725E4E2971756C7F3)>.

This section briefly describes the rationales underpinning the two interventions outlined above. The common aim for both initiatives is to boost competition, in particular by promoting a greater variety of business models along different levels of the value chain. The ultimate goal is to increase consumer surplus through lower prices, higher quality of service, greater choice and continuous innovation.

1. Increased competition among banks

The most obvious rationale underpinning both Open Banking initiative (and PSD2 in general)¹⁵ is to increase competition in retail banking, particularly for PCAs, by increasing transparency on the demand side. The concern is that the persistent low levels of switching are in large part caused by customer inertia due to lack of engagement, which in turn is the result of high search costs due to the difficulty consumers encounter in comparing substitutes.¹⁶ By forcing large incumbents to share data on both their tariffs (and other quality attribute parameters such as branch location and opening hours) and customers' consumption profiles, 'aggregators' are able (with the customer consent) to provide bespoke comparisons tailored to the specific consumption profile.

Therefore, besides the increased pricing rivalry due to the reduction of search costs, consumers could in principle also benefit from more bespoke tariffs that better match their

¹⁵ In addition, the European Commission was of course motivated by the fundamental aim of furthering the European Single Market by making it easier for consumers to make cross-border payments. See Commission staff working document impact assessment Accompanying the document Proposal for a directive of the European parliament and of the Council on payment services in the internal market and amending Directives 2002/65/EC, 2013/36/UE and 2009/110/EC and repealing Directive 2007/64/EC and Proposal for a Regulation of the European Parliament and of the Council on interchange fees for card-based payment transactions, SWD/2013/0288 final <<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013SC0288>>.

¹⁶ See n. 3.

consumption profile. For example, a consumer who regularly holds high credit balances would prefer a tariff with a high deposit rate, whilst a consumer who regularly goes into overdraft would benefit more from low fees.¹⁷ In addition, third-party apps can add value by nudging consumers into adjusting their consumption profile in order to avoid incurring fees in the first place. This is particularly the case with respect to the use of overdraft facilities.

A corollary of the reduction in consumer search cost is that new and small rivals (often labelled ‘challengers’) will find it easier to entice large incumbents’ retail depositors, whilst potentially benefiting from a reduction in customer acquisition costs, given the growing importance of this online distribution channel which entails lower fixed and sunk costs to invest in a branch network and brand-building advertising campaign.¹⁸ The ability to attract retail deposits is considered to be essential in order to compete in retail lending markets such as prime residential mortgages and consumer credit. In the aftermath of the 2007 financial crisis the mainstream business model for retail banking hinges on the supply of retail deposits providing the cheap and stable source of funding that underpins their net interest margin (NIM) profitability.¹⁹

¹⁷ It is worth noting, though, that heavy users of arranged overdraft facilities tend to have higher incomes and higher education than non-overdraft users and those who use unarranged overdrafts. Ibid, para. 80.

¹⁸ For example, the CMA investigated the impact of PCWs in the private motor insurance market. The CMA found that PCWs increased pricing rivalry among insurers. In addition, as PCWs have grown in importance and increased their advertising expenditure, some insurers have reduced their own advertising and become more focused on providing the best price through PCWs. See CMA, Private motor insurance market investigation - Final report (September 2014) <https://assets.publishing.service.gov.uk/media/5421c2ade5274a1314000001/Final_report.pdf>, paras. 8.4-8.6.

¹⁹ See n. 3, paras. 9.134-9.139. For more international evidence, see Rungporn Roengpitya, Nikola Tarashev, Kostas Tsatsaronis and Alan Villegas, ‘Bank business models: popularity and performance’ (2017) BIS Working Papers No 682 <<https://www.bis.org/publ/work682.htm>>.

2. Unbundling

Besides increased pricing rivalry thanks to reduction in search costs, another aim underpinning the implementation of Open Banking and PSD2 is to foster product and service innovation, in particular by allowing consumers to more easily purchase and manage products from a variety of financial service providers, in particular non-bank ones.²⁰ This is particularly so with respect to payment services, which are typically bundled with the provision of deposit accounts. In this respect, the provision of RTGS access to NBPSPs is complementary to PSD2 in promoting competition in payment services. The ability of NBPSPs to plug into payment systems directly does not only entail a potential reduction in marginal costs (i.e., saving on the intermediary margins charged by agent banks),²¹ but also more control on service quality (i.e., in particular in terms of prompt response to service disruptions), including on the timing of service upgrades and innovations.²² Customers would tend to benefit from lower prices and better quality of service (including innovations).

The category of customers more likely to benefit initially are businesses (especially SMEs), given that it is merchants, and not consumers, who are typically charged transactional fees, such as the interchange fee for card-based payment transactions. Therefore, increased competition on the merchant-side from NBPSPs may adversely impact banks' BCA income due to the resulting loss of transactional fees income.²³ Foreign currency (FX) transactions are

²⁰ See n. 3, para. 15.11.

²¹ In fairness, however, the level of price charged by large banks to provide indirect access to NBPSP has not raised competition concerns: *ibid*, para. 9.204(b).

²² See Bank of England, 'A new RTGS service for the United Kingdom: safeguarding stability, enabling innovation' (2016), para. 11 <<https://www.bankofengland.co.uk/-/media/boe/files/payments/a-new-rtgs-service-for-the-uk-safeguarding-stability-enabling-innovation.pdf?la=en&hash=2FE6ABB33839969FDB3E07C538293DFE31CB4005>>.

²³ *Ibid*, para. 4.61.

another obvious source of transactional fees income (for both PCAs and BCAs) which may come under increased competitive pressure thanks to unbundling.

III. THREATS TO THE MAINSTREAM RETAIL BANKING BUSINESS MODEL AND IMPLICATIONS FOR FINANCIAL AND MONETARY POLICY

This section assess in detail the various challenges to retail banking, and the corresponding potential implications for financial stability and monetary policy, resulting from the combined implementation of Open Banking (and PSD2) and the provision of RTGS access to NBPSPs.²⁴ In doing so, it also explores how banks may strategically react in order to stifle the competition threats posed by non-bank operators.

1. Reduced profitability

The most immediate impact likely to arise from the combined implementation of Open Banking / PSD2 and the provision of RTGS access to NBPSPs is a squeeze on PCAs' profitability as a result of the combined increase in the overall cost of raising retail deposits and reduction in non-interest fees income.

The ultimate aim of Open Banking is to empower third party apps that can assist consumers in finding the best deal based on their individual needs. By and large, and with respect to PCAs, this entails a higher deposit rate and lower fees; depending on which pricing component is more relevant based on individual consumption profiles. The CMA estimated that PCAs revenues across the industry could dwarf if all customers who would benefit from

²⁴ See (with reference to Open Banking) Bank of England, 'Financial Stability Report' (London, November 2017), p. 39 <<https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-report/2017/november-2017.pdf?la=en&hash=F6D65F714A7DC28394BC4FCC9909CCD39E28AD10>>; and also (reference to excess volatility induced by, and systemic importance of, aggregators) Financial Stability Board, 'Financial Stability Implications from FinTech' (Basel, June 2017) p. 20 <<http://www.fsb.org/wp-content/uploads/R270617.pdf>>.

doing so switched to a cheaper product.²⁵ With respect to cash savings account, the FCA estimated that, even in the current low interest rate environment, consumers who would benefit from switching accounted for above 40% of overall balances.²⁶ Over the long term, it is foreseeable that Open Banking may be applied to retail lending as well, for example prime residential mortgages.²⁷

In practice, though, the materiality of such an impact will depend on the rate of adoption of ‘aggregators’. It could be argued that those ‘back-book’ customers who stand to benefit the most are also the most difficult to sign up, due to their disengagement and thus inertia. Whereas those ‘early adopters’ who are more predisposed to use ‘aggregators’ (i.e., and willing to share their personal data with a third-party AISP) are also likely to be the kind of ‘front-book’ customers who are already more active given their relatively larger deposit balance. The distribution of deposits is typically skewed, with a large majority of customers holding modest balances and a small minority holding very high balances.²⁸ Hence, both groups by and large would tend to be similarly important for incumbent banks in terms of their respective volumes of deposits in aggregate. In contrast a new bank may be overexposed to the latter group (and

²⁵ The CMA found that PCAs generated revenues of around £8.7 billion in 2014 (ibid, para. 11.22) and that on aggregate consumer gains could be around £4.6 billion per year (ibid, para. 11.26).

²⁶ See FCA, ‘Cash savings market study report’, January 2015 <<https://www.fca.org.uk/publication/market-studies/cash-savings-market-study-final-findings.pdf>>, para. 7.16.(a). Similarly, Bank of England staff estimated the cost of funding advantage to the large incumbent banks to be around £1bn each year (see n. 14).

²⁷ With respect to residential mortgages, the FCA found that slightly less than a third of consumers could save £550 per year: see FCA, “Mortgages market study – Interim report”, May 2018 <<https://www.fca.org.uk/publication/market-studies/ms16-2-2-interim-report.pdf>>, para. 1.19.

²⁸ See n. 26, p.17.

active / engaged consumers in general) for the simple fact that it has not been active long enough to amass a large ‘back-book’ of sticky depositors.

Unbundling of payment and FX services can further intensify the squeeze on banks’ non-interest fees income from both PCAs and BCAs. More in general, and together with the adoption of ‘aggregators’, unbundling might undermine banks’ hold on the customer relationship, thus potentially weakening their status as ‘gateway keeper’, whereby the PCA provider is able to cater for a broader set of customer needs by cross-selling other financial products.²⁹

The impact that more intense competition for insured retail deposit can have on banks’ safety and soundness, and financial stability in general, has been investigated with respect to the credit risk dimension. Higher deposit rates resulting from increased competition would tend to squeeze banks’ net interest rate margins. Lower profitability not only entails lower ability to accumulate loss-absorbing capital, thus making banks more fragile, but also might induce more risk-taking in an attempt to recover profitability.³⁰

²⁹ In fairness, though, the CMA found that the proportion of consumers who obtain additional product from their PCA provider is below 30% on average: see FCA, ‘Competition Report 2013-16’ <<https://www.fca.org.uk/publication/corporate/competition-report-2013-16.pdf>>, p. 14.

³⁰ See Michael C. Keeley, ‘Deposit Insurance, Risk, and Market Power in Banking’ (1990) 80 *American Economic Review* 1183; Carmen Matutes and Xavier Vives, ‘Imperfect Competition, Risk Taking and Regulation in Banking’ (2000) 44 *European Economic Review* 1; Franklin Allen and Douglas Gale, ‘Competition and Stability’ (2004) 36 *Journal of Money, Credit and Banking* 453; Thomas F. Hellmann, Kevin C. Murdock and Joseph E. Stiglitz, ‘Liberalization, Moral Hazard in Banking and Prudential Regulation: Are Capital Requirements Enough?’ (2000) 90 *American Economic Review* 147; and Rafael Repullo, ‘Capital Requirements, Market Power and Risk-Taking in Banking’ (2004) 13 *Journal of Financial Intermediation* 156. Rune Stenbacka and Tuomas Takalo, ‘Switching costs and financial stability’ (2016, Bank of Finland Research Discussion Paper 2) <http://www.suomenpankki.fi/en/julkaisut/tutkimukset/keskustelualoitteet/Documents/BoF_DP_1602.pdf>

a. Banks' possible reactions

All the impact estimations reported above are static, in the sense that they ignore how banks may react in order to mitigate the impact thereof. However, it is plausible to foresee that firms will seek ways to forestall disruption.

First of all, nothing would prevent incumbent banks from launching their own 'aggregator' in order to pre-empt being disintermediated by non-bank AISPs.³¹ However, the success of this pre-emptive strategy would rest on the perceived degree of openness: i.e., the extent to which the expert advice received from their 'aggregators' could be perceived by consumers as genuinely independent. This is reminiscent of the struggle faced by European mobile network operators (MNOs) in the late 2000s during the early phases of the third-generation (3G) mobile technology which allowed a radical expansion of mobile data services.³² The common strategy to launch their own proprietary data portals ('walled gardens')

investigated under what circumstances a reduction in switching costs would increase or decrease banks' cost of retail funding and, thus, their vulnerability to financial stress. Where competition is for a new cohort of unaffiliated depositors, a reduction in switching costs reduces firms' cost of funding as the incentive to invest in market share is weakened. Their model therefore suggests that a reduction in switching costs would lead firms to offer lower rates to younger, digitally-savvy depositors. In contrast, where banks are mainly reliant on 'locked-in' depositors, a reduction in switching costs will spur 'business stealing' incentives whereby firms try to poach each other customers. It is fair to say that the latter effect is more likely to dominate given the low churn rate typically observed in banking (e.g., the flow of new unaffiliated retail depositors is negligible compared to the stock of affiliated retail depositors). The resulting increase in deposit rates hurts banks' profitability and thus weakens financial stability.

³¹ See, for example, Emma Dunkley, 'HSBC plans to poach customers from rivals with new app' *Financial Times* (London, 28 September 2017) <<https://www.ft.com/content/a1eaa94e-a376-11e7-b797-b61809486fe2>>.

³² See Godfrey Chua, 'Mobile networks at the tipping point: the data explosion and next generation network challenge' (2010) IDC White Paper <<http://juniper.jmsshare.com/pdfs/juniper-lte-and-epc-transformation.pdf>>.

left MNOs exposed to disintermediation when the app store concept was introduced, as consumers preferred the option to select their content of choice from an unrestricted, and thus wider, repository.³³

Under a scenario where the use of third-party ‘aggregators’ by retail depositors is widespread, pricing rivalry would be bound to increase, thanks to the reduction in consumer search costs which provides incentives to smaller banks to undercut large incumbents (i.e., by offering a higher deposit rate and / or lower fees) in order to trigger an inflow of deposits needed to sustain an expansion in retail lending markets. However, incumbent firms may react by promptly introducing a new tariff that matches rival prices in order to retain their deposit bases. This strategy would be particularly effective in resisting challengers’ aggressive strategic stance to the extent that those customers more likely to switch (i.e., because they rely on ‘aggregators’) would still find it more convenient to upgrade to the new tariff offered by their current provider (e.g., and thus avoid the hassle to go through know-your-customer (KYC) checks in order to open a new account). Furthermore, this targeted response would mitigate the impact in terms of increased cost of funding to those (marginal) depositors who have a higher propensity to switch.³⁴

At one extreme, firms might lose the incentive to undercut prices in the first place, as they anticipate that rivals’ immediate price-matching responses would render the reduction in

³³ See, for example, Paul Taylor and Daniel Thomas, ‘Content providers and operators at peace’ *Financial Times* (London, 11 March 2012) <<https://www.ft.com/content/8a70f350-69dd-11e1-a26e-00144feabdc0>>.

³⁴ In this sense, this strategy would be equivalent to the use of most-favoured-customer (MFN) clauses when customers face heterogeneous ‘hassle’ costs to request that the current provider match the better price offered to another customer. For a theoretical treatment, see Paolo Siciliani and Walter Beckert, ‘Spatial models of heterogeneous switching costs’ (2017) Bank of England’s Staff Working Paper No. 689 <<https://www.bankofengland.co.uk/working-paper/2017/spatial-models-of-heterogeneous-switching-costs>>.

price thereof ineffective (and potentially counterproductive, due to the risk that their own current customers upgrade to the better tariff).³⁵ Paradoxically, firms would therefore be able to coordinate their prices up to monopolistic levels in the knowledge that they would be insulated from rivals' price undercutting. Therefore, the radical reduction in consumer search costs brought about by Open Banking and the widespread adoption of 'aggregators' might backfire, with firms able to recover their profitability underpinned by low cost of funding not because of customer inertia, but thanks to firms' collective strategic reactions.

However, such a collective response aimed at neutralising the competition impact of Open Banking may draw the attention of competition authorities. Indeed, the scenario outlined above is strongly reminiscent of the current debate among antitrust practitioners around the use of pricing algorithms in order to facilitate price parallelism.³⁶ Specifically, it would resemble what has been labelled the 'predictable agents' category of collusion,³⁷ whereby each rival firm unilaterally adopts a pricing algorithm that enables conscious parallelism by closely monitoring each other' prices and promptly reacting to price changes, in particular in case of price

³⁵ This is assuming that firms are not allowed to prevent current customers from selecting the new tariff targeted at new ones. This non-discrimination constrain may be the result of conduct expectations coming from the consumer protection / competition authority: *ibid*. In this respect, it is worth pointing that in the UK the FCA is also a concurrent competition authority with a primary consumer protection objective: see (references to price discrimination) FCA, 'FCA Mission: Our Approach to Competition', December 2017 <<https://www.fca.org.uk/publication/corporate/our-approach-competition.pdf>>.

³⁶ See OECD, 'Algorithms and Collusion – Competition policy in the digital age', (2017) <<http://www.oecd.org/daf/competition/Algorithms-and-collusion-competition-policy-in-the-digital-age.pdf>>.

³⁷ Ariel Erzachi and Maurice E. Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (Harvard University Press 2016). See, also, Autorité de la concurrence and Bundeskartellamt, 'Competition Law and Data' (2017) <<http://www.autoritedelaconcurrence.fr/doc/reportcompetitionlawanddatafinal.pdf>>.

undercutting. Nevertheless, it is also broadly acknowledged that, in the absence of evidence of direct or indirect communication between the alleged colluders (i.e., to agree to adopt pricing algorithms), enforcement under competition law would be quite challenging.³⁸

A more plausible scenario, though, would see the cost of raising retail deposit being bid up to the point where large incumbent banks would rather switch to other sources of wholesale funding: as large incumbents are more likely to have this option,³⁹ ‘challenger’ banks would expect price-matching reactions to be withdrawn at that point.

Another pricing strategy that could be deployed by incumbent banks to mitigate the risk of a fall in profitability is bundling, a form of price discrimination adopted by a multi-product firm where the price for the bundle is lower than the sum of stand-alone prices (i.e., a bundled discount). PCAs are bundles as, besides deposit-taking, they typically include payment and FX services, and also the provision of unsecured consumer credit through overdraft facilities. In practice, banks could set a higher PCA price (i.e., either through a higher upfront fee or a lower deposit rate) if the customer doesn’t use the PCA for payment or FX services, for example. Therefore, the use of bundled pricing by incumbent banks can put a non-bank rival selling only one product (e.g., payment or FX services) at a competitive disadvantage if the latter cannot afford to compensate customers for the loss of the implicit bundled discount.

More broadly, banks could design wider product bundles that contain other financial products alongside PCAs, such as mortgages or retail investment products. This loyalty-

³⁸ Ibid.

³⁹ This is particularly the case given the recent expiry of the Bank of England’s Funding for Lending Scheme (FLS) and Term Funding Scheme (TFS), two facilities which for years provided funding to banks and building societies at rates close to base rate: see, for example, Simon Hills, ‘What does the end of the term funding scheme mean for risk?’ *UK Finance* 1(London, 9 April 2018) < <https://www.ukfinance.org.uk/what-does-the-end-of-the-term-funding-scheme-mean-for-risk/>>.

inducing pricing practice may take the form of a menu of usage fees, whereby consumers would be presented with two lending (saving) rates, a lower (higher) one for loyal customers who buy the bundle and a higher (lower) one for those who buy on a stand-alone basis. The use of wider product bundles could be effective in reducing consumer propensity to switch – i.e., notwithstanding the reliance on ‘aggregators’ - by making it more inconvenient, as consumers would have to switch over the entire bundle of products or face higher standalone prices for those services that are kept with the current provider. For example, this is common practice in the telecommunications sector where 80% of UK consumers buy some form of product bundle.⁴⁰

Competitive rivalry among banks, however, can undermine the sustainability of this strategy. This is so to the extent that there are firms with the incentive not to be aligned to the use of bundled pricing in order to grow their customer base by attracting those consumers who have a preference for unbundling (i.e., by not penalising them with a higher price). Those conditions tend to prevail when there are smaller firms with a capacity to expand at the expense of large incumbents. For example, returning to the mobile telephony analogy during the late 2000s, MNOs generally regarded Voice over the Internet Protocol (VoIP) services, which allowed consumers to make calls without facing additional charges (i.e., typically with a call set-up fee and a charge per minute), as a fundamental threat to their mainstay source of revenue. Therefore, there were multiple attempts to either exclude the use of VoIP applications outright, limit their use or price discriminate against their use. Nevertheless, none of these strategies

⁴⁰ See Ofcom, ‘Communications Market Report’ (August 2017), p. 11 <https://www.ofcom.org.uk/_data/assets/pdf_file/0017/105074/cmr-2017-uk.pdf>. It is worth pointing out that the sector regulator, Ofcom, dropped plans to intervene in order to facilitate switching across bundles: see Nic Fiddles, ‘Ofcom abandons plans to make ‘bundled’ switching easier’ Financial Times (London, 14 July 2017) <<https://www.ft.com/content/7f09ce1c-689f-11e7-9a66-93fb352ba1fe>>.

worked as rival MNOs reacted by launching all-inclusive and unrestricted data plans that allowed consumers to use VoIP applications.⁴¹

2. Operational risk

The use of APIs to connect banks' IT systems with third-party apps inexorably increases banks' operational risk as it provides more opportunities for cyber-attacks and IT disruptions in general. This is particularly problematic with respect to payment initiation services as, under PSD2, banks are required to reimburse their customers in the first instance in the event that something goes wrong, such as a payment is misdirected or there is an unauthorised transaction.⁴² In addition, under Article 83 of the EU General Data Protection Regulation,⁴³ which came into force in May, firms can face hefty administrative fines in respect of some serious breaches. At the same time, banks are expected not to use cyber risk as an excuse to thwart the adoption of third-party apps (e.g., by sending alarming messages to customers regarding the risk of being hacked).⁴⁴

⁴¹ See OECD, 'Digital convergence and beyond: innovation, investment, and competition in communication policy and regulation for the 21st century' (DSTI/ICCP/CISP(2015)2/FINAL, may 2016), pp. 22-23 <[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DSTI/ICCP/CISP\(2015\)2/FINAL&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DSTI/ICCP/CISP(2015)2/FINAL&docLanguage=En)>.

⁴² See FCA, 'Payment Services and Electronic Money – Our Approach. The FCA's role under the Payment Services Regulations 2017 and the Electronic Money Regulations 2011' (September 2017), para. 8.213 <<https://www.fca.org.uk/publication/finalised-guidance/fca-approach-payment-services-electronic-money-2017.pdf>>.

⁴³ Regulation of the European Parliament and the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ L 119/1.

⁴⁴ See Karina McTeague, 'Payments after PSD2: evolution or revolution' (Speech by FCA Director of Retail Banking Supervision, 10 April 2018) <<https://www.fca.org.uk/news/speeches/payments-after-psd2-evolution-or-revolution>>.

The greater risk, though, may arise from reputational repercussions whereby the data breach has permanently dented customer trust, thus making it more difficult for the bank in question to acquire new, or even retain current, customers. However, the severity of this risk would arguably depend on whether the blame for the data breach can be laid down on a specific bank. Whereas, to the extent that the consumer loss of trust affects the generality of banks the adverse market impact might not materialise in the end. This is because consumers would still have to use a bank. Therefore, under these circumstances the loss of trust would mainly affect ‘aggregators’ as consumers would want to mitigate the risk of further data breaches by stopping using them. And this would be the case regardless of whether ‘aggregators’ were actually to blame for the data breach. Under these circumstances, firms might have weak incentives to prevent such an occurrence. However, it is reasonable to presume that firms cannot foresee how customers would react in the event of a breach, which should restore their incentive to avert reputational damage.

3. Deposit mobility

The vast majority of retail deposits are held in PCAs and cash savings accounts,⁴⁵ which are both contractually redeemable on demand. Nevertheless, banks treat them as behaviourally stable in light of the fact that consumers are on average disinclined to switch account provider, even if only partially (i.e., by opening a new account whilst keeping the current one open and active). This stylised fact is reflected in the generous calibrations attributed to this source of funding under both the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR),⁴⁶ two standards introduced under the Basel III Accord that impose minimum liquidity

⁴⁵ For the split of funds among different types of savings account: see n. 26, p. 14.

⁴⁶ Specifically, under Article 421(1) of Regulation (EU) No 575/2013, on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (Capital Requirements Regulation

adequacy requirements for banks.⁴⁷ In a nutshell, the more a bank relies on this source of stable funding, the lower the expectation that the bank in question might come under stress because of a sudden outflow of funds and the less the need to tie funds in low yielding high-quality liquid assets (HQLA) – i.e., the more the bank can engage in maturity transformation.⁴⁸

The widespread adoption of third-party ‘aggregators’ by retail depositors may undermine the behavioural stability of sight retail deposits to the extent that consumers become more prone to transfer balances to an account held with a different bank.⁴⁹ Increased deposit mobility may worsen a situation of liquidity stress in both an idiosyncratic or systemic event. In the former case, the expected run-off of sight retail deposits may intensify if, because it is now so easy for consumers to move their balances to an account opened with another bank, consumers prefer to do so rather than face the marginal inconvenience of having to wait for the refund from the deposit guarantee scheme (DSG). That is to say, the removal of ‘hassle costs’ thanks to the use of ‘aggregators’ (i.e., whereby consumers can shift funds at the touch of a

– CRR), retail deposits that are covered by a deposit guarantee scheme (DGS) and which are either ‘part of an established relationship making withdrawal highly unlikely’, or ‘held in a transactional account, including accounts to which salaries are regularly credited’ are subject to an outflow rate of 5%.

⁴⁷ See European Banking Authority (EBA), ‘Report on Net Stable Funding Requirements under Article 510 of the CRR’ (EBA/Op/2015/22, December 2015), p. 75 <<https://www.eba.europa.eu/mwg-internal/de5fs23hu73ds/progress?id=7HRrMpb8AKUZaMLBUGIXC6RjtP-Fbqzr3-Az67SKzNM.&dl>>; see also Basel Committee on Banking Supervision, ‘Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools’ (January 2013), pp. 33-34 <<https://www.bis.org/publ/bcbs238.pdf>>.

⁴⁸ The assigned outflow rate of 5% entails that firms must hold £5 of HQLA for every £100 of deposits.

⁴⁹ It is worth noting that unless the consumer has already opened an account with a different bank (i.e., multi-banking) the balance transfer would not be immediate due to the administrative process involved in opening an account, including KYC and anti-money laundering (AML) checks. Nevertheless, innovations such as electronic identity and the ability to open an account remotely should radically speed up this process.

button) may reinstitute the risk of a bank-run notwithstanding the presence of a comprehensive and trusted DSG.⁵⁰ However, by the same token there may be new potential customers who are willing to face that inconvenience whilst earning the higher interest rate presumably offered by the stressed bank in order to stem the run-off. The net outcome would depend on the balance of these two opposite effects.

In the concomitant event of a systemic liquidity stress, the outflow of sight retail deposit may intensify if the bank in question is unable to match rivals' prices, as they would also presumably be bidding up their demand for deposits in order to stem a run-off. The situation of stress may be compounded if the bank is forced to pass on the higher 'front-book' promotional rate also to existing customers, perhaps because of a conduct requirement / expectation banning (history-based) price-discrimination between new and existing customers.⁵¹ At the extreme, what started as a situation of liquidity stress may precipitate into a solvability crisis, that is, also as the unintended consequence of an intervention by the conduct regulator aimed at protecting ('back-book') consumers.

⁵⁰ It goes without saying that this risk is worse if the DSG is neither comprehensive nor trusted by the general public. See Rajkamal Iyer and Manju Puri, 'Understanding bank runs: The importance of depositor-bank relationships and networks' (2012) 102 American Economic Review 1414.

⁵¹ For example, in the context of a market study on banks' provision of cash saving accounts, the FCA considered the imposition of a 'return switching form' remedy, a very simple 'tear-off' form and pre-paid envelope enabling a customer to switch to a better paying account offered by their existing firm more easily: see FCA, 'Cash Savings Market Study Update', July 2016, para. 1.7 <<https://www.fca.org.uk/publication/market-studies/ms14-02-4-update.pdf>>. See also (reference to price discrimination between consumers with low and high switching costs as a potential indicator of consumer harm, thus as a potential trigger for intervention) FCA, 'FCA Mission: Our Approach to Competition', December 2017, p. 12 <<https://www.fca.org.uk/publication/corporate/our-approach-competition.pdf>>.

The propensity to promptly match rival prices would tend to be higher for those banks that are overexposed towards ‘early adopters’ / ‘front-book’ depositors, as typically the case with new ‘challenger’ banks, in particular when adopting an on-line only business model. In other words, the presence of this type of firms may exacerbate a situation of liquidity crisis by fuelling a price escalation in deposit rates, thus increasing contagion risks. This macro-prudential risk would be particularly concerning in a systemic stress scenario whereby banks access to alternative sources of wholesale funding is constrained.⁵²

Following the logic of the Basel III’s liquidity adequacy prudential standards, were insured sight retail deposits to be no longer considered a stable source of funding, banks would have to increase their holdings of HQLA, thus shrinking their lending to the real economy.⁵³

⁵² In this respect, Xavier Vives, *Competition and Stability in Banking. The Role of Regulation and Competition Policy* (Princeton University Press, 2016), p. 257 reported how the Spanish prudential authority, the Bank of Spain, gave a verbal instruction to banks to limit remuneration of deposits and saving accounts in order to put an end to what was described as a “liability war” among distressed banks and with a view to protect entities’ capital-generation capacity. Similarly, the US FDIC was reported to put pressure on an online bank to lower its deposit rates in 2009: see Ron Lieber, F.D.I.C. Is Watching as a Bank Sets Rates *New York Times* (NYC, 12 June 2009) <<http://www.nytimes.com/2009/06/13/your-money/brokerage-and-bank-accounts/13money.html>>.

⁵³ Liangliang Jiang, Ross Levine and Chen Lin, ‘Competition and Bank Liquidity Creation’ (NBER Working Paper No. 22195, April 2016) <<http://www.nber.org/papers/w22195>> showed how banks subject to increased competition, as proxied by an increase in the number of competing firms, cut their exposure to illiquid loans. Similarly, Hendrik Hakenes and Isabel Schnabel, ‘Bank size and risk-taking under Basel II’ (2011) 35 *Journal of Banking & Finance* 1436 developed a model where the introduction of the internal rating based model approach under the Basel II Accords - which basically allows large firms to reduce capital requirements for low risk assets compared to smaller firms –leads to an increase in competition for retail deposits, driven by large firms seeking additional funds for their expanding lending book. Smaller firms, therefore, must react by also increasing their deposit rates in order to retain deposits, which in turn leads them to select higher risk loans.

Rather than triggered by a liquidity stress, price escalation may be the result of anticompetitive predatory conducts by incumbent banks. In theory, under a frictionless supply of retail deposit an incumbent bank could ratchet up the deposit rate in order to corner the retail deposit market, which in turn would allow the bank in question to monopolise the lending market as well.⁵⁴ In a more plausible scenario, though, oligopolistic incumbent banks may trigger temporary price wars in order to either sustain a collusive pact among themselves by punishing deviations (i.e., in the form of price undercutting), or deter ‘challenger’ banks from either entering or expanding in the market by raising retail deposits. With respect to the latter, the more the customer base of the target prey is predominantly made up of ‘front-book’ / active customers, the stronger the deterrence effect; whereas the profit sacrifice incurred by the incumbent banks may be circumscribed if their own ‘back-book’ customers do not benefit from the higher deposit rates. This type of conduct, though, may well be found to be in breach of competition law entailing hefty administrative fines.⁵⁵

Finally, deposit mobility may affect the transmission of monetary policy. Specifically, whilst banks will want to promptly pass on rate increases to depositors,⁵⁶ they might not want

⁵⁴ For a theoretical treatment: see Marie-Odile Yanelle, ‘Banking Competition and Market Efficiency’ (1997) 64 *Review of Economic Studies* 215.

⁵⁵ Specifically, price wars could be taken to be evidence of either an anticompetitive agreement under Article 101 of the Treaty on the Functioning of the European Union (TFEU), or an abuse of a collective dominant position under Article 102 TFEU, depending on whether there is or not evidence of direct or indirect communication among the alleged firms. The fine is limited to 10% of the overall annual turnover of the company.

⁵⁶ Itamar Drechsler, Alexi Savov and Philipp Schnabl, ‘The Deposit Channel of Monetary Policy’ (2017) 132 *Quarterly Journal of Economics* 1819 showed that when the Fed funds rate rise, banks with market power do not pass this on to depositors.

to pass on cuts unilaterally for fear of being subject to a sudden outflow.⁵⁷ This coordination failure would therefore entail an asymmetric transmission mechanism with stickiness for rate reductions.

a. Banks' possible reactions

The most obvious reaction by banks would be to change the mix of retail deposit products by increasing the proportion of fixed term deposits (or notice savings). This may be particularly so for small and medium sized banks which typically rely more on fixed term deposits than larger incumbents.⁵⁸ To the extent that the use of 'aggregators' allows consumers to optimise their cash flows (i.e., thanks to the provision of financial advice and management tools), and thus minimise the cash buffer held for precautionary reasons (i.e., to avoid accidentally moving into overdraft), consumers may put a larger proportion of their savings into fixed-term products. However, the effectiveness of this coping strategy in the aggregate must be limited to the extent that consumers have a strong preference for liquidity.⁵⁹ That is to say, to persuade consumers to lock-in more of their savings, fixed-term rates must go up comparatively, thus entailing a greater hit on profitability.

⁵⁷ Michael D. Noel, 'Edgeworth Price Cycles and Focal Prices: Computational Dynamic Markov Equilibria' (2008) 17 *Journal of Economics and Management Strategy* 345 demonstrated how, in a triopoly setting where firms set prices sequentially, there can be 'false starts' where firms fail to relent from a price war because the first firm to increase price abandons its high price altogether, after waiting too long for others to follow. Therefore, this type of coordination failure is endemic in a setting with four firms.

⁵⁸ See n. 26, Figure 6 at p. 24 (showing how, for small and medium sized banks, the majority of the savings based is held in fixed term products, in contrast to the funding mix of larger banks).

⁵⁹ This is particularly the case considering, for example, that the difference between the highest-paying cash savings account (with 12 months bonus) and the equivalent 1 year bond in the UK is 60bsp, whereas consumers would have to lock-in their savings for at least 3 years in order to earn 100bsp more (based on data from moneyfacts.co.uk, consulted on 03 May 2018).

Bundled pricing is another obvious coping strategy with the difference that this time in order to benefit from the preferential rates on other financial products consumers would be required not only to have a PCA / savings account with the same provider, but also to use it as the primary deposit account, that is, by paying the salary into the account and / or maintaining a minimum average credit balance.

A radically new approach aimed at averting a price escalation because of rivals' price-matching reactions would be to reassure them about the fact that the targeted volume inflow of retail deposits is capped.⁶⁰ In essence, this would entail disclosing the targeted volume inflow of sight retail deposits. For example, banks could award a promotional rate (over a period of, say, 12 months) up to a specified amount on a first-come-first-served basis.⁶¹ As people withdraw balances from their on-demand deposit accounts the next consumers in line will be awarded the promotional rate until the volume target is reached again (i.e., as long as the firm in question still needs to raise additional funds). Alternatively, rather than setting the promotional rate, firms could instead recur to an auction system similarly to the way online advertising is sold.

⁶⁰ Because of consumer inertia, it currently takes a prolonged period of time to trigger an inflow of funds (i.e., measured in months), and the shorter the timeframe the higher ought to be the deposit rate premium required to trigger the inflow: see Ching-Wai Chiu and John Hill, 'The rate elasticity of retail deposits in the United Kingdom: a macroeconomic investigation' (Bank of England Staff Working Paper No. 540, August 2015) <<https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2015/the-rate-elasticity-of-retail-deposits-in-the-uk-a-macroeconomic-investigation.pdf?la=en&hash=AB6601DA6FE08D756E16F86786636578162BCC50>>. Therefore, firms have plenty of notice to withdraw the promotional rate when they have reached their targeted inflow of retail deposits. However, this might no longer be the case in a frictionless environment.

⁶¹ Firms should be allowed to price discriminate between existing and new customers (i.e., thus preventing arbitrage by the former who would want to shift existing balances to benefit from the promotional rate).

In this sense, the market for sight retail deposits would resemble the interbank market for unsecured wholesale short-term funding whereby banks with a surplus of deposits lends it to banks with a deficit. Indeed, considering that the bank with a surplus would only be willing to lend it at a rate that is above the one paid to retail depositors, and that the marginal cost for raising retail deposits is set by ‘front-book’ customers, the firm with a deficit would, by definition, be better off triggering an inflow of retail deposits directly rather than borrowing on the interbank market, that is, as it would be odd for the firm with a surplus to want to hold on to it at any cost by matching prices.

4. Disintermediation

The competition threat posed by NBPSPs, as empowered by the combined implementation of Open Banking / PSD2 and the provision of access to RTGS, is contained by the fact that their ability to provide an alternative to a money storage facility is very limited. For example, the difficulty of paying salaries into ‘digital wallets’,⁶² provided by e-money institutions, limits their ability to be seen by consumers as a functional substitute for PCAs.⁶³

Indeed, NBPSPs are required to safely safeguard all client funds. Specifically, to comply with the safeguarding requirements set by the financial conduct regulator, a NBPSPs would normally have to either deposit client funds in a segregated account at a bank, invest in secure and low risk assets (e.g., gilts), or insure the relevant funds.⁶⁴ The first option, which is

⁶² According to the CMA (see n. 3, para. 4.24), “[a] digital wallet is a service that facilitates the storage of payment (and possibly other) credentials and enables users to make payments, either online or via a mobile device. In some cases it can also be used as a facility to store money. In the UK, digital wallets are currently offered by several providers, including PayPal, Apple, Google and Amazon but not by banks.”

⁶³ Ibid, para. 4.26.

⁶⁴ See FCA, ‘Payment Services and Electronic Money – Our Approach’ (September 2017), paras. 10.29-10.56 <<https://www.fca.org.uk/publication/finalised-guidance/fca-approach-payment-services-electronic-money-2017.pdf#10>>.

by large the most commonly adopted, not only entails an operating cost for the NBPSPs (i.e., banks normally charge fees for non-retail deposit accounts), but also entails that consumers move their savings outside the protection of the DGS (i.e., as the segregated funds would be classified as corporate deposits). Therefore, neither the NBPSP nor the consumer should want to move funds outside the consumer's bank current account, i.e., beyond what's necessary for payments execution.

However, thanks to the provision of access to RTGS, NBPSPs have the additional option to use their new settlement account held at the central bank to store client funds.⁶⁵ This option not only allows NBPSPs to avoid bank's charges, but also provides the safest possible storage solution for consumers. Indeed, in principle direct access to RTGS would allow NBPSPs to provide a service that is functionally equivalent to that of a PCA, apart from the provision of overdraft facilities, although it wouldn't be hard to imagine that other non-bank providers of consumer credit could partner with the NBPSPs in order to offer lines of credit bundled with the payment and deposit-taking functionalities. Initially, such a proposition would be particularly appealing to corporations and SMEs, which act as merchants within payment networks and do not generally benefit from the DGS. Accordingly, the availability of a safer store of deposits may be especially valuable to them.

It could be argued that NBPSPs are not allowed to do that as it would amount to taking deposit, which is a regulated activity that requires a banking licence. However, under point (1) of Article 4(1) of the CRR, 'credit institution' means an undertaking the business of which is to take deposits or other repayable funds from the public and to grant credits for its own account. The causal link between the two separate activities of taking deposits in order to lend them to borrowers is clearer under the UK definition, which states that the activity of

⁶⁵ Ibid, para. 10.42.

accepting deposits is a specified kind of activity if: (a) money received by way of a deposit is lent to others; or (b) any other activity of the person accepting the deposit is financed wholly, or to a material extent, out of the capital or of the interest on money received by way of a deposit.⁶⁶ This approach was endorsed by EBA.⁶⁷

Accordingly, as long as client funds are not used for lending, but are merely deposited in their settlement account in line with the safeguarding requirements, it may be difficult to accuse NBSPs of performing a regulated activity that requires a banking licence. Nevertheless, it could be argued that were a NBSP to be successful in attracting a large base of sight retail deposits it would probably want to become a bank itself in order to capitalise on this valuable source of stable funding by lending the funds raised. In other words, although the provision of access to RTGS may enable NBSPs to provide a functional substitute for BCAs / PCAs, it is not clear why they would want to do so.

First of all, they might be forced to do so in response to banks' attempt to foreclose them through bundled pricing, whereby those bank customers who choose to use NBSPs for payment services end up paying higher prices for a BCA / PCA (and possibly other bundled retail financial services) compared to customers who don't.⁶⁸ Therefore, NBSPs would have to add a fully-fledged deposit-taking functionality as part of customer-acquisition costs in order to compensate consumers for the loss of the implicit bundled discount they would otherwise

⁶⁶ Article 5 of the Financial Services and Markets Act 2000 (Regulated Activities) Order 2001 (SI 2001/544).

⁶⁷ See EBA, 'Report to the European Commission on the perimeter of credit institutions established in the Member States' (November 2014), para. 34 <<https://www.eba.europa.eu/documents/10180/534414/2014+11+27+-+EBA+Report++Credit+institutions.pdf>>.

⁶⁸ A more robust strategy that could be deployed by banks is tying, whereby the provision of PCA / BCA (the tying product) is conditional on the purchase of payment services (the tied product): see Xavier Vives, 'The Impact of Fintech on Banking' (2017) 2 European Economy 97, p. 103.

face if they kept their BCA / PCAs. In other words, banks reaction to the competition threat of unbundling might unintendedly lead to their full disintermediation.

Secondly, stand-alone profitability may not be the paramount guiding principle for the NBPSPs. For example, as it is common with many online business models, the NBPSPs may rely on alternative sources of revenues based on the monetisation of the data collected through the provision of current account services. More generally, internet giants such as Google, Amazon, Facebook and Apple (collectively labelled GAFAs), plus new challengers Baidu, Alibaba and Tencent (collectively labelled BATs), appear to compete by adding services to their bundle of products in order to cement customer loyalty, so that their calculations would look at the incremental value (i.e., over and beyond stand-alone profitability) that the new service would add to the attractiveness of their broader platform.⁶⁹

All else equal, young cohorts may find this offer more appealing than dealing with a bank, simply for the fact that they may have already built up an established customer relationship with an internet giant by the time one typically has to open up a bank account (i.e., when leaving the parental home). In addition, consumers may perceive such a proposition to be safer than a bank current account (i.e., notwithstanding the protection under the DGS),⁷⁰ thanks to the fact that their money would be stored in a settlement account at the central bank.

a. Implications for financial stability

From a financial stability perspective, the implications of the disintermediation scenario outlined above are equivalent to the concerns raised with respect to the introduction of

⁶⁹ However, some of those operators, such as Amazon and Google, are also (potential) providers of cloud services to banks. Therefore, they would also have to consider the fact that they would stand to lose at least part of the corresponding revenue under a disintermediation scenario.

⁷⁰ This suggests that the less trusted the DGS is the stronger is the disintermediation competition threat.

universally available central bank digital currencies (CBDC).⁷¹ Several central banks are exploring the merits of CBDC and, in particular, the radical idea that the public could be given access to the central bank balance sheet to store their cash holdings in a personal account.⁷² In addition, people would also be able to make payments and transfers thanks to the provision by private operators of complementary services such as ‘digital wallet’ and transaction verification. Hence, the universal disintermediated access to the central bank’s balance sheet, combined with the payment service functionalities offered by accredited digital wallet service providers, would provide depositors, both retail and corporate, with a potential substitute for deposit account services offered by commercial banks.

At a minimum, the competition threat posed by the non-bank operator can increase banks’ cost of funding, thus squeezing their NIMs, with potential repercussions on the asset side of banks’ balance sheet due to the resulting pressure to pass on the cost increase to borrowers through higher lending rates, thus potentially leading to ‘risk shifting’. More radically, though, banks may be subject to an outflow of retail deposits, in particular in a scenario of financial stress (i.e., so-called ‘digital runs’),⁷³ thus forcing them to shift their mix of sources of funding towards alternative wholesale forms of debt with a longer tenor, that is, in order to maintain liquidity adequacy. Under an extreme scenario, the loss of retail deposits would force banks to adopt a ‘narrow-banking’ business model, whereby lending activity is

⁷¹ See Banks for International Settlements (BIS), ‘Central bank digital currencies’ (March 2018), pp. 15-16 <<https://www.bis.org/cpmi/publ/d174.pdf>>.

⁷² See Morten Bech and Rodney Garratt, ‘Central bank cryptocurrencies’ (BIS Quarterly Review, September 2017) <https://www.bis.org/publ/qtrpdf/r_qt1709f.pdf>; and Ben Fung and Hanna Halaburda, ‘Central Bank Digital Currencies: A Framework for Assessing Why and How’ (Bank of Canada Staff Discussion Paper 2016-22, November 2016) <<http://www.bankofcanada.ca/2016/11/staff-discussion-paper-2016-22/>>..

⁷³ See BIS (2018), n. 71, p. 16.

entirely reliant on non-insured funding from retail and wholesale investors.⁷⁴ This could potentially greatly increase the pro-cyclicality of the credit supply (at least with respect to the flow of new lending),⁷⁵ which would in turn push the central bank to step in during downturns by taking riskier and less liquid assets on its balance sheet as collateral against the provision of liquidity to financial intermediaries through lending facilities.⁷⁶

IV. FORESEEABLE REGULATORY RESPONSES

This section discusses what changes may be needed to existing prudential rules in order to address the threats posed by the undermining of the behavioural stability of sight retail deposits and the outflow of deposits in aggregate towards NBPSPs. This is done whilst keeping in mind the risk for unintended consequences. With respect to the other two threats outlined in the previous section, reduced profitability and increased operational risk, the existing prudential toolbox should suffice.

1. Deposit mobility

The first obvious response to the observation that sight retail deposits are no longer stable would be to update the corresponding calibrations under liquidity adequacy rules (i.e., to increase the hypothetical outflow rate in a liquidity stress scenario). Indeed, according to EBA's guidelines issued in 2013, "[banks] should assign retail deposits accessed via high risk

⁷⁴ See, for example, Marilyne Tolle, 'Central bank digital currency: the end of monetary policy as we know it?' *Bank Underground* (25 July, 2016) <<https://bankunderground.co.uk/2016/07/25/central-bank-digital-currency-the-end-of-monetary-policy-as-we-know-it/>>. See also Vítor Constâncio, 'The future of finance and the outlook for regulation' (Remarks by Vice-President of the ECB at the Financial Regulatory Outlook Conference, Rome, 9 November 2017) <<https://www.ecb.europa.eu/press/key/date/2017/html/ecb.sp171109.en.html>>.

⁷⁵ Under a 'narrow banking' model, lenders should not have a maturity mismatch between assets and liabilities, which would prevent the risk of fire sales under a liquidity stress.

⁷⁶ See BIS (2018), n. 71, p. 14.

distribution channels such as internet only access banks, other forms of remote access and brokered deposits (where brokers collect funds from a natural person or SME) to higher outflows”.⁷⁷ It is fair to say that the reference to internet only access as a “high risk distribution channels” appears outdated nowadays, given that the availability of ubiquitous online banking has become a must-have feature to stay competitive in retail banking (i.e., a hygiene factor more than a differentiating attribute). Moreover, it is debatable whether the use of aggregators should qualify as a “brokered deposit”. In any case, the European Commission ruled out the possibility to assign a higher outflow based merely on the basis that the sight retail deposit account is internet only.⁷⁸

It would be odd if this rule was changed as part of the ongoing review of CRR,⁷⁹ in particular, given that doing so would be fundamentally inconsistent with what PSD2 set out to achieve. This is because if internet only sight retail deposits that are managed through an ‘aggregator’ platform were to be assigned a higher outflow rate, banks would be given the incentive to price discriminate against them to reflect the fact that those deposits have become a costlier source of funding. This is not only because a higher proportion of low-yielding HQLAs would have to be kept on the balance sheet, but also to the extent that the

⁷⁷ EBA, ‘Guidelines on retail deposits subject to different outflows for purposes of liquidity reporting under Regulation (EU) No 575/2013, on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (Capital Requirements Regulation – CRR)’ (EBA/GL/2013/01, December 2013), p. 13

⁷⁸ Commission Delegated regulation (EU) 2015/61 of 10 October 2014 to supplement Regulation (EU) No 575/2013 of the European Parliament and the Council with regard to liquidity coverage requirement for Credit Institutions, Article 25.3(a) [2015] OJ L 11/1.

⁷⁹ For more information, visit <http://www.europarl.europa.eu/legislative-train/theme-deeper-and-fairer-internal-market-with-a-strengthened-industrial-base-financial-services/file-crr-amending-capital-requirements>.

leverage ratio (LR) is the biting capital requirement, which would entail a higher marginal capital charge in the funding mix.

In any case, a rule change (ex-ante) merely on the basis of a presumption may turn out to be unwarranted. For a start, the adoption of ‘aggregators’ may be limited to the same ‘front-book’ consumers who already show a high propensity to switch. In addition, as discussed in section III.3.a., banks may succeed in preventing deposit mobility through loyalty-inducing pricing schemes, by committing to promptly match rivals’ prices or by publicly setting the quantity of demanded deposits, or a combination thereof.

Ultimately, the rationale for a change in the assigned outflow rate for sight retail deposits should be grounded on an assessment as to how insured retail depositors would behave in a situation of both idiosyncratic and systemic stress. Regarding the latter, as explained in section III.3., a bank may be able to offset an outflow of deposits by contemporaneously triggering an inflow from consumers who are attracted by the higher remuneration, whilst not inconvenienced by the eventuality of having to wait for compensation from the DGS. Regarding the former, in the event of a systemic crisis the risk is not that banks would face a greater outflow of sight retail deposit in aggregate (i.e., flowing out of the banking sector altogether), but that they might be engaged in a price war in order to retain their deposit bases.⁸⁰

Therefore, a more appropriate regulatory response would be to put a cap deposit rates. This could be achieved through either direct or indirect intervention. In the former case, all

⁸⁰ In economic parlance, deposit mobility, in response to a reduction in consumer search and switching costs, would tend to increase the own-price elasticity of firms’ residual demand (i.e., the demand faced by individual firms once rivals’ reactions are accounted for), but not the price elasticity of the market-wide demand.

banks would be banned from setting deposit remuneration rates above a certain threshold;⁸¹ whereas, in the latter case, the central bank would intervene by setting up a lending facility scheme in order to provide banks with an alternative source of funding,⁸² thereby implicitly capping deposit rates by setting haircut rates to be applied to pledged collateral assets.

The latter option would appear to be preferable. First, it would be easier to administer, as the authority in charge of enforcing the direct price cap would have to monitor possibly a large number of different tariffs.⁸³ However, the latter option may require the central bank to assess the credit risk of (i.e., in order to assign a corresponding haircut rate to) category of assets which it may be unfamiliar with (e.g., corporate bonds). Second, indirect intervention would be less distortionary, in the sense that the price paid for the use of the lending facility would still be based on the relative quality of the pledged assets, thus mitigating moral hazard.⁸⁴

The tricky aspect in both cases would be to establish at what level the cap should be set in order to trigger intervention.⁸⁵ For example, intervention would be certainly warranted where the supply of retail deposits has become price inelastic, in the sense that the overall supply of retail deposits stays flat notwithstanding the escalation in the available deposit rate (i.e., rivalry among banks has become a zero-sum game).

⁸¹ See n. 52, p. 257, with reference to how the prudential authority was compelled to intervene to stop what it described as a ‘liability war’ among stressed banks during the 2007-08 financial crisis.

⁸² Accordingly, this option would require close coordination between the prudential and monetary authorities.

⁸³ For example, consumers may be offered a better deal through lower fees and charges rather than higher deposit rates.

⁸⁴ In this sense, this intervention resembles the imposition of risk-sensitive deposit insurance premia.

⁸⁵ In reaching this assessment the prudential authority (both micro and macro) should consult with the competition authority (ibid, p. 287), although there might not be the time for a fully-fledged competition assessment.

2. Disintermediation

The first obvious response to the observation that banks are haemorrhaging retail deposits to NBPSPs would be to shut down what at first scrutiny would appear as regulatory arbitrage, in the sense that the collection of retail deposits by NBPSPs impinges on a regulated activity that requires a banking licence. Accordingly, NBPSPs could be simply banned from placing client funds in their settlement account beyond what strictly needed to execute payments (i.e., for the purpose of providing intraday liquidity).⁸⁶ This would amount to a maximum reserve ratio, as opposed to a minimum reserve ratio as normally the case for banks. Alternatively, NBPSPs could be charged a negative rate on deposited funds deemed to be excessive.

However, as explained in section III.4., as long as NBPSPs do not lend client funds, but instead safely store them in compliance with the safeguarding requirements, it would be hard to argue that their activity is in circumvention of prudential rules. In any case, NBPSPs could also opt for getting a banking authorisation in the first place. In this respect, it is often argued that the likes of GAFAs have so far stayed clear from entering the retail financial sector (i.e., banking and insurance) as they are deterred by the burdensome compliance requirements related to both conduct and prudential rules. However, under a business model whereby the bank in question commits to systematically put all the deposit raised in its settlement account at the central bank, compliance requirements would not be burdensome. For example, prudential capital requirements would not be biting, either under the risk-

⁸⁶ See Bank of England, 'Bank of England Settlement Account' (July 2017), para. 7 <<https://www.bankofengland.co.uk/-/media/boe/files/payments/boesettlementaccounts.pdf?la=en&hash=5902F70D257DC5BCAE4E40E4E6D87F8C6FFF8BA4>>.

weighted approach,⁸⁷ or the LR framework.⁸⁸ The same would hold for prudential liquidity adequacy requirements, given that reserves held at the central bank are treated as HQLAs.⁸⁹ However, the bank in question may still have to pay DGS premia, that is, even when they are risk-based.⁹⁰

This is to say that the imposition of a maximum reserve ratio for NBPSPs might be seen as unfairly discriminatory and protectionist. In addition, it might also be unsustainably unpopular with the general public in the event of a systemic ‘digital run’, where the banking sector is exposed to an outflow of sight retail deposits in aggregate.⁹¹

⁸⁷ Under CRR, Article 114.4, exposures to Member States' central governments, and central banks denominated and funded in the domestic currency of that central government and central bank shall be assigned a risk weight of 0%.

⁸⁸ With respect to the latter, the UK Prudential Regulation Authority (PRA) recently amended its LR rules so that claims on central banks, where they are matched by deposits accepted by the firm that are denominated in the same currency and of identical or longer maturity, are excluded from the calculation of the total exposure measure (i.e., the LR denominator). See PRA, ‘UK leverage ratio: treatment of claims on central banks’ (Policy Statement, PS21/17, October 2017) <<https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/policy-statement/2017/ps2117.pdf?la=en&hash=80814EA4BC51C46ACE51C7CEBF1859CC9AA2452C>>.

⁸⁹ CRR, Article 416.1(a).

⁹⁰ For example, EBA guidelines specify a minimum range of between 75% and 150%, so that the safest possible firm would still have to pay half as much as for the riskiest one: see PRA, ‘Calculating risk-based levies for the Financial Services Compensation Scheme deposits class’ (Statement of Policy, February 2017), para. 2.4 <<https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/statement-of-policy/2017/calculating-risk-based-levies-for-the-fscs-deposits-class-sop-update.pdf?la=en&hash=AAA45341CF34A1584C02C425F459CA20FF59BEBE>>.

⁹¹ This is reminiscent of the argument against the imposition of quantitative limits to the issuance of CBDC, typically through a supply-demand clearing system based on changes to the interest rate that applies to CBDC: when agents seek safety at almost any price, the magnitude of the negative rate that would have to be imposed in

Therefore, as for the case of deposit mobility a less contentious intervention would be to provide banks with an alternative source of funding through a lending facility scheme. The difference may be that in this case the intermediating role played by the central bank may be permanent in case the shift in consumer preferences away from banks turns out to be persistent.

V. CONCLUSIONS

The combined impact of the implementation of Open Banking (and PSD2) and the provision of RTGS access to NBPSPs is poised to disrupt the traditional reliance of retail banks on sight retail deposits as their main source of funding. Although retail banks may be able to react defensively in a number of ways, this might paradoxically end up accelerating their demise. Hence, it might be better for them to accommodate this transition rather than resist it. This is particularly so to the extent that the transition will only be gradual and determined by the changing demographics, as young cohorts are more inclined to patronise non-bank challengers. Regulators should also be careful not to react too hastily, mindful of the risk for unintended consequences. Ultimately, the best regulatory response might also be to accommodate what would be a paradigmatic transition by taking a more active role in terms of financial intermediation.

order to ‘absorb’ the ensuing excess in demand would certainly be too high to be politically sustainable. See n. 71, p. 17.