



Banc Ceannais na hÉireann
Central Bank of Ireland

Eurosystem

2017

EXCHANGE TRADED FUNDS

Discussion Paper



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Executive Summary

1. Exchange traded funds (“ETFs”) have experienced exponential growth since they were first established in 1990 with more than US\$4tn in assets globally as at the end of April 2017.¹ ETFs are investment funds which are traded on stock exchanges and other markets in the same way as listed equities are (and so can be purchased at any time during the trading day, can be purchased on margin and can be short sold). Because ETFs enable investors to achieve diversified exposure through a regulated investment fund structure they are used by both retail and institutional investors alike. Retail use is predominantly for long term investment, asset allocation purposes and for other investment strategies. The attraction of ETFs to the institutional investor can span from the use of ETFs as a proxy for index futures (because, for example, there is no need to manage the margin requirements and expiration dates that are associated with futures trading) to their use in hedging strategies (by taking positions in individual securities and taking an opposite position in an ETF tracking the same market sector). ETFs are also used as an efficient tool by institutions and other investment funds as a way of investing cash during periods of change (such as a change in investment manager or change in investment strategy) and as portfolio “building blocks” (i.e. an investment fund could use ETFs to build portfolio exposure rather than accessing underlying markets directly).
2. The attraction of ETFs can also be attributed to their (relative) cheapness. Because ETFs are generally passively managed, the cost of purchasing and selling securities within an ETF portfolio is lessened. ETFs are also cheaper to administer because of the limited number of investors who interact directly with them. For the same reasons their management fees tend to be comparatively less than actively managed investment funds. These features have encouraged the continued growth of ETFs which, today, shows no signs of abating.
3. Ireland is the major location within the EU single market for the authorisation of ETFs. This Discussion Paper underpins an invitation to Stakeholders to help inform the Central Bank’s participation in any international or European regulatory discussions on the topic and its supervisory work. It is therefore designed to galvanise a deepened exchange of views on ETFs.
4. The Discussion Paper is organised around a number of key themes and highlights discussion points identified from a review of the relevant literature, from discussions with

¹ ETFGI data sourced from ETF/ETP sponsors, exchanges, regulatory filings, Thomson Reuters/Lipper, Bloomberg, publicly available sources, and data generated in-house

international regulatory colleagues and from the Central Bank of Ireland's own supervisory experience.

5. The first focus is on the unique primary dealing and secondary trading arrangements which are an inherent part of the design of ETFs. The Discussion Paper elaborates on a number of potential discussion points relating to this key feature of ETFs. It discusses the extent to which reliance can be placed on disclosure of facts concerning the ETF's arrangements to provide appropriate degrees of protection for investors and discusses how these dealing and trading arrangements are likely to operate in stressed market conditions.
6. The second focus is on pushing forward the discussion on the assessment of the risks inherent in the ETF structure. The Discussion Paper looks at connectedness between authorised participants and other interested parties. It also looks at synthetic ETFs and, in particular at counterparty and collateral risk issues.
7. As ETFs continue to grow in popularity, the range of different types of ETFs is growing. The third focus of the paper is on some of these types of ETFs, notably leveraged and inverse ETFs, and active ETFs. The discussion of active ETFs highlights the debate on how to achieve the right level of transparency in relation to active ETFs.
8. What is the impact of ETFs on market liquidity for the assets in which they invest? The Discussion Paper reviews a range of studies on this issue and identifies apparent complexities, which appear to suggest that the impact of ETFs on market liquidity can vary significantly over different time horizons and in relation to different assets. However, the matter is complicated by the need to differentiate between the impact of the ETF structure and the impact of the passive investment strategies characteristic of many, but not all, ETFs (although not solely ETFs). Given the increasing importance of market liquidity for regulators, this complex topic would seem to require substantial further academic work (particularly in a European context); however, industry comment on their experiences is also important to regulators in understanding these impacts.
9. Several national regulators of important ETF markets and international and supranational securities regulators have recently embarked on work which is either focused on ETFs or which is broader but contains specific segments which look directly at ETFs. The Central Bank believes it is essential that it is well placed to contribute to these kinds of discussions in a meaningful and impactful way. Information and opinions gathered from respondents to this Discussion Paper will also support the Central Bank in continuing to authorise and effectively supervise ETFs in both the current environment and as the ETF industry develops further.

10. This Discussion Paper seeks stakeholder views on a number of specific questions. Stakeholders are, however, invited to provide observations and commentary on any aspect of the Discussion Paper.

Introduction

Although exchange-traded funds (“ETFs”) date back to the early 1990s, their increasing popularity has constituted the major investment market innovation in the post-crisis period. At the end of 2016 there was almost US\$3.4tn in ETF assets globally with more than US\$542bn of this in European ETFs.² The international growth of ETFs both in terms of number, exposure delivered, structure, and assets does not appear to be slowing, with predictions of global ETF assets reaching US\$6tn by 2020.³

Ireland is one of the principal domiciles for European ETFs⁴ and many of the largest global ETF promoters domicile their European products in Ireland. The Central Bank of Ireland (the “Central Bank”) has authorised the largest number of European ETFs which are, in the main, passported for sale on a cross-border basis, mostly within the EU single market. As at 31 December 2016 there was more than €287bn in 688 Irish ETFs.⁵ Some industry commentators have estimated that the Irish ETF industry could grow exponentially in the coming years with some estimates of US\$800 billion invested in Irish ETFs by 2021.⁶

Investors have flocked to ETFs because they are easily tradeable, usually associated with passive investment strategies which attract low direct management charges.⁷ Market commentary suggests that ETFs are viewed by market participants as simple, transparent, diversified, liquid products which are easy to invest in. As they increase in popularity they now also offer increasingly niche exposures. Consequently, since the economic crisis ETFs have received striking amounts of asset inflows,⁸ to the apparent detriment of actively managed investment funds.⁹

² Source: ETFGI data sourced from ETF/ETP sponsors, exchanges, regulatory filings, Thomson Reuters/Lipper, Bloomberg, publicly available sources, and data generated in-house. <http://etfgi.com/index/home>

³ Source: EY Global ETF Survey 2016: [http://www.ey.com/Publication/vwLUAssets/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey-2016/\\$File/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey-2016.pdf](http://www.ey.com/Publication/vwLUAssets/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey-2016/$File/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey-2016.pdf)

⁴ The study carried out by the French Autorité des Marchés Financiers (2017), *ETFs: Characteristics, Overview and Risk Analysis – The Case of the French Market* (the “AMF Study”) identified Ireland as the largest European domicile for ETFs, having a 56% market share. The AMF Study is available at http://www.amf-france.org/en_US/Publications/Lettres-et-cahiers/Risques-et-tendances/Archives.html?docId=workspace%3A%2F%2FSpacesStore%2F2d61ede7-b0be-40fa-8654-fe438a33ad00

⁵ Source: Central Bank of Ireland

⁶ <http://www.pwc.ie/media-centre/press-release/2016/2016-pwc-ireland-irish-etfs-have-potential-to-reach-800-billion-dollars-by-2021.html>

⁷ ETFs can be “cheap” by two reference points; the management costs (the “total expense ratio,” or “TER” is typically lower than actively managed investment funds) and also they offer cheap exposure (because the spread on an ETF can be lower than the corresponding aggregate spread on underlying securities represented by the ETF).

⁸ Globally, ETF assets stood at US\$716 billion in December 2008. Source: ETFGI data sourced from ETF/ETP sponsors, exchanges, regulatory filings, Thomson Reuters/Lipper, Bloomberg, publicly available sources, and data generated in-house. <http://etfgi.com/index/home>

⁹ The Wall Street Journal noted that in 2016 that US actively managed investment funds experienced more than US\$285bn in outflows while, at the same time US index tracking investment funds and ETFs gathered more than

Because of their recent growth and their likely continued growth in the period ahead, there is every reason to believe that ETFs will be an even more important element of the global funds market. Any such locus of innovation requires close regulatory attention to ensure that the benefits of innovation are delivered within a robust, but enabling, regulatory framework. Inevitably, this Discussion Paper focuses on the regulatory challenges which may be raised by the growth of ETFs. Little attention is therefore given to their substantial beneficial effects although it is important to acknowledge these when considering any issues raised in this paper.

An ETF is an investment fund which is not only admitted to trading on a regulated market (a stock exchange) but is also actively traded on the stock exchange or other markets.¹⁰ It is often described as having “hybrid” features because it combines so many of the aspects of an open-ended investment fund (access to a diverse portfolio of underlying securities run by a professional investment manager) with those of a security traded on exchange (instant access to market exposure). ETFs are efficient with one of the key benefits being that they can be purchased or sold intra-day, at spot prices, as opposed to other investment funds which, in practice, can only be invested or redeemed at end-of day prices. Furthermore, because they are traded like equities, investors can buy or sell ETFs in the same way that they trade any other listed stocks; for example, they can be bought on margin and sold short, making them very efficient and flexible instruments for trading and hedging purposes. ETF options are also available in a number of cases thereby permitting investors to use ETFs to implement a variety of strategies which would otherwise be more difficult or expensive to arrange. While acknowledging these benefits, this Discussion Paper focuses on an understanding of the ETF structure, its dynamics and risks with an awareness and appreciation of the advantages ETFs have.

It appears that the primary dealing arrangements of ETFs are important to achieving this level of liquidity. The supply of shares of ordinary listed companies which are actively traded is usually “fixed” (at least in the trading period horizon), but ETFs have a feature unique among actively exchange-traded financial instruments, namely the creation and redemption mechanism characteristic of investment funds.¹¹ Whoever has access to the issuer of a security to increase the supply of that security to cover short exposure has a significant risk management capacity not otherwise available to market participants. Equally, the capacity to arrange with an issuer to take back shares, enables the closing out of long positions without risking secondary market

US\$429bn in assets: <http://blogs.wsj.com/moneybeat/2016/12/29/2016-saw-record-flows-into-index-funds-and-out-of-active-ones/>.

¹⁰ While ETFs are investment funds, the term “investment fund” in this Discussion Paper is a reference to the universe of non-ETF investment funds.

¹¹ A “creation” is the process by which ETF shares are purchased directly from the ETF. It is known as a “subscription” in non-ETF investment funds.

trading.¹² ETFs provide this facility to certain selected market participants and it seems critical to the high levels of secondary market liquidity they have achieved. This is because it incentivises active trading of the ETF shares by significant market participants (who receive a spread on trades) who will, in turn, trade ETF shares for reasons other than buying or selling into or out of positions taken further to an investment strategy. We examine this process in more detail in Section I.

Our purpose in this Discussion Paper is to raise questions around the existence of risks in this primary dealing mechanism and whether, if there are such risks, they are well understood by regulators. To date, the regulatory strategy to deal with ETFs operates by relying on two different regulatory regimes to regulate them. Although ETFs are constituted as investment funds (and thereby subject to the full spectrum of investment fund regulation) they are also exchange-traded financial instruments, like equities or bonds, and as such are subject to stock exchange rules and regulations applicable to publicly traded assets (specifically, MiFID II,¹³ and MAD/MAR¹⁴). This dual nature means that ETFs are subject to the overlapping framework of both the UCITS Directive¹⁵ and MiFID, both of which are designed to address specific issues and risks. A key question in regulatory policy is whether these overlapping regulatory frameworks allow the

¹² By enabling APs to redeem creation units with the ETF. In this way, ETFs provide market makers with an additional tool to manage their trading book: the subscription and redemption machinery of the ETF primary market. The structure of an ETF was not designed as a solution to a market maker's trading demands. Rather, it was designed around batch trading, daily valuations, and secondary market investors. The factors which will instigate a creation or redemption of ETFs can be quite different from those of secondary market investors which are linked to the very unique shape of ETF liquidity.

¹³ Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU and Markets in Financial Instruments Regulation (EU) No. 600/2014 together with a number of implementing and delegated acts ("MiFID II") repeals and replaces the existing MiFID Directive (Directive 2004/39/EC).

¹⁴ Directive 2014/57/EU on criminal sanctions for market abuse ("MAD"), Regulation (EU) No 596/2014 on market abuse (market abuse regulation) and repealing Directive 2003/6/EC of the European Parliament and of the Council and Commission Directives 2003/124/EC, 2003/125/EC and 2004/72/EC ("MAR"). We do not consider further here any questions to do with regulation to prevent market abuse. In principle, because ETFs constitute a second way to gain exposure to an underlying asset and because having two ways to access exposure to any asset creates a potential for hiding abusive trading, there may be a distinctive set of questions arising in relation to the regulation of ETFs with regard to market abuse. This would arise particularly if the underlying assets were traded on a market that was either primarily OTC, under conditions where OTC trading was not transparent or not well monitored. As the range of assets upon which ETFs are based on broadens, this issue may be becoming more pertinent. It is notable that the SEC in the USA has recently declined to approve an ETF based on bitcoin in part because the underlying asset operated in markets where the SEC did not have assurance of the quality of the monitoring against market abuse. See <https://www.sec.gov/rules/sro/batsbzx/2017/34-80206.pdf>. However, any observations any party wishes to make on this issue of potentially distinctive market abuse regulatory issues are welcome.

¹⁵ Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), including the associated implementing measures contained in Directive 2010/43 and Directive 2010/44/EU, as amended by Directive 2014/97/EU of the European Parliament and of the Council (the "UCITS Directive"). Irish ETFs are usually established as UCITS and, where they are, they must contain the identifier "UCITS ETF" in their name. They are thereby readily identifiable. "UCITS ETF" is defined in ESMA's Guidelines on Guidelines on ETFs and other UCITS issues ESMA/2014/937 ("ESMA Guidelines") as a "UCITS at least one unit or share class of which is traded throughout the day on at least one regulated market or Multilateral Trading Facility with at least one market maker which takes action to ensure that the stock exchange value of its units or shares does not significantly vary from its net asset value and where applicable its Indicative Net Asset Value." In Ireland, ETFs are structured as segregated sub-funds of "umbrella fund" investment companies, either under the Companies Act 2014 or under the Irish Collective Asset-management Vehicle Act 2015. ETF sub-funds of the investment company can be added from time to time. It is possible to structure ETFs as alternative investment funds, all Irish ETFs (bar one) are authorised as UCITS.

specific features of ETFs to be appropriately regulated.

ETFs have been subject to a number of assessments by regulators in recent years.¹⁶ This Discussion Paper is being published as part of that on-going international debate and revisits some of those themes in light of the continuing increase in importance of ETFs. As with those previous contributions, this Discussion Paper approaches issues primarily from the perspective of ETFs as investment funds because, while they are subject to the overlapping frameworks of both UCITS and MiFID, ETFs are, first and foremost, regulated investment funds. Notwithstanding that, this Discussion Paper does include a discussion of the impact of ETFs on market liquidity which is intended to complement other discussions of this topic.

As part of its ETF work, the Central Bank has had discussions with international regulatory colleagues, industry representative bodies, funds service providers and a number of investment managers who are involved in the ETF industry. In October 2016, the Central Bank also conducted a survey covering all providers of Irish authorised ETFs to obtain information in relation to the ETFs managed by them and to ascertain the views of ETF providers on a variety of matters (“CBI Survey”). The CBI Survey has been very valuable to the Central Bank in framing the issues set out in this Discussion Paper.

A previous discussion paper published by the Central Bank on asset management regulation focused on loan originating funds and led to the development of the loan originating funds chapter in the AIF Rulebook. The Central Bank does not currently envisage that this Discussion Paper will lead to a similar outcome. While it may prove appropriate to consider (in consultation with industry) whether additional guidance on particular aspects of ETF practices is warranted, the Central Bank sees the primary benefit of this Discussion Paper more as being a contribution to the international regulatory debate and to the risk assessments regulators must constantly refresh in order to supervise the market effectively.

Overarching themes

A number of overarching themes have arisen during the course of the Central Bank’s ETF work. Broadly speaking these relate to investor expectation, liquidity and the increasing popularity of ETFs.

¹⁶ See, for example, IOSCO’s Principles for the Regulation of Exchange Traded Funds (<http://www.iosco.org/library/pubdocs/pdf/IOSCOPD414.pdf>), work carried out by the Ontario Securities Commission on disclosure standards for ETFs (<http://www.osc.gov.on.ca/documents/en/InvestmentFunds/etf-facts-document-testing.pdf>), the AMF Study (referred to above in footnote 3) proposed work streams by the US Securities and Exchange Commission with specific ETF focus (<https://www.sec.gov/news/speech/white-speech-keynote-address-ici-052016.html>), work carried out by the US Office of Financial Research which identified ETFs as potentially having a role in generating and propagating liquidity stress (https://www.financialresearch.gov/financial-stability-reports/files/OFR_2015-Financial-Stability-Report_12-15-2015.pdf) and the Financial Stability Board (“FSB”) (2017) *Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities*, (<http://www.fsb.org/wp-content/uploads/FSB-Policy-Recommendations-on-Asset-Management-Structural-Vulnerabilities.pdf>).

Investor expectation

Securities regulation relies strongly on the capacity of investors to choose investments which align with their risk appetite, including their liquidity risk appetite. However, the structure and operation of an ETF is quite different to either non-ETF investment funds or to equity securities. Therefore, while ETFs can often deliver quite simple exposures they might be considered as complex. The resulting question is whether investors genuinely understand the instrument in which they are investing (or if they simply assume they do). Arising from this is a consideration of alignment of investor expectation and the likely operational performance of ETFs in all market conditions.

As ETFs grow in popularity, their investor base broadens. The question that arises is whether the increasing popularity of ETFs has made them more attractive to investors for whom they are less appropriate? It is true that in Europe, it continues to be the case that institutional and professional investors are the predominant users of ETFs. That being said, a question can be raised as to whether that broadening base of institutional investors always include a realistic assessment of how ETFs will perform in stressed market conditions in their own liquidity planning? In addition, as ETF providers seek to increase retail use of ETFs regulators are interested to understand whether retail investor expectations are aligned with the manner in which an ETF could perform in stressed market conditions.

The marketing of ETFs emphasises that they are open-ended and traded intra-day. This is true in stable market conditions, but not necessarily in all market conditions. It would be interesting to understand whether the manner in which ETFs are marketed results in an expectation of tradeability in all market conditions (and if this is the case, could this perception, if widespread, add to market fragility?). It is also useful to ask what other expectations an investor might have when purchasing an ETF and whether these are consistent with the likely operation of an ETF in stressed market conditions. Do investors in ETFs believe they benefit from the protection that investors of record in a UCITS clearly have?

Liquidity

Closely related to this question of the changing profile of investors, is the complex profile of ETF liquidity. Secondary trading in ETFs does not necessarily require an ETF to access its underlying asset market and quite often, the liquidity of an ETF can be greater than its underlying assets. This means that while the liquidity of an ETF is intertwined with the liquidity of its underlying assets, it is not wholly dependent on the liquidity of underlying assets. It seems best to think of an ETF as subject to liquidity risk in relation to its underlying assets as well as liquidity risk generated by the unique creation/redemption mechanism adopted by it (specifically, ETF liquidity

is dependent on the trading activity of Authorised Participants (“APs”) and Official Liquidity Providers (“OLPs”). High levels of liquidity in stable market conditions are supported by the intermediating activity of APs and OLPs. As ETFs broaden their range of investment exposures, this formula of enhanced ETF liquidity (supported by the creation/redemption mechanism) seems to become more significant, particularly in cases where underlying asset classes are themselves characterised by less robust liquidity. Of interest is that while the liquidity features of ETFs are promoted the potential for underlying assets to be significantly less liquid remains.

Increasing popularity of ETFs

Underlying both these points, the Central Bank wishes to focus in this Discussion Paper on drawing out the significance of the recent strong volume of flows into ETFs globally. Previous regulatory assessments have looked at the structure of ETFs when they formed a smaller part of the total market. Those assessments recognised the robustness of the regulatory and market framework within which they operate. The many positive features of ETFs have been acknowledged (from both a market and an investor’s perspective). For example, the ability, through the structure of a single share to offer diversification and niche market exposure, the contribution ETFs make to market liquidity and the ability to use ETFs to efficiently achieve differing market strategies. Additionally, their lower management fees have proven an attractive option for many investors.

The underlying point in this Discussion Paper is to revisit whether that balance of benefit will continue in the face of increased growth. Particularly, can the regulatory framework in which ETFs operate bear the weight increased growth brings or could it, itself, lead to a significant market failure?

It is noted that the UCITS and MiFID II frameworks could address some of the questions posed above. It is, however, of interest to the Central Bank to hear Stakeholders’ views about how a regulatory framework which does not specifically contemplate ETFs sufficiently addresses the peculiarities of their hybrid structure. Are there market practices and procedures which reinforce the “simple” structure that appears to underpin ETFs such that increased scale does not necessitate further regulation or heightened supervision?

A large range of market participants have expressed their confidence in the structure of ETFs by the scale of investment in it. Many of these are strongly informed investors who will have carefully reviewed the nature of ETFs before investing. The fact that this Discussion Paper raises a range of risk issues does not imply that the Central Bank has concluded that there is an issue which requires action. On the contrary, there may be reason to believe that in many regards ETFs are

strongly robust. However, the regulation of a structure which is of such increasing importance needs to be scrutinised constantly.

The Central Bank is therefore publishing this Discussion Paper in order to seek the views of interested Stakeholders (including those participants which interact with ETFs from the markets perspective) on these and the other matters which the Central Bank is considering as part of its ETF work. The Central Bank anticipates that feedback received to this Discussion Paper will assist it in contributing effectively and influentially to international discussions on ETFs.

A number of key questions are posed throughout this Discussion Paper. Stakeholders are requested to provide responses to the questions contained throughout this Discussion Paper. They are also invited to provide any general observations on the matters discussed or issues raised herein. The Central Bank asks anyone considering responding to aim to do so by 11 August, 2017 by emailing a response in Word format to fundspolicy@centralbank.ie clearly labelled 'ETF Discussion'. The current intention is to publish written contributions submitted. We will determine the next stages of our work on ETFs in the light of the responses received and the on-going development of international debate. Among the options for consideration are to publish a feedback statement covering some or all the topics raised here and/or one or more specific feedback notes on particular issues, after we have had time to consider the responses received and done any further additional research the different topics may require.

Matters for discussion

Section I: ETF dealing

1. ETFs are a “genuine financial innovation.”¹⁷ This is in part because their development has been associated with the growth of passive investment strategies.¹⁸ It is primarily because their dealing arrangements combine a creation/redemption process (“primary dealing”) which is somewhat similar to that of an open-ended investment fund,¹⁹ with arrangements which have proven successful in encouraging secondary market trading (“secondary trading”). In the case of ETFs, primary dealing at the prevailing net asset value of shares and secondary trading in ETF shares on the secondary market at a mutually agreed spot price, co-exist.²⁰ The innovation of the ETF dealing arrangements result in questions which are considered in this section.
2. While many investment funds are admitted to trading on regulated markets it is often the case that no trading occurs in their shares. ETFs by way of contrast have shares which are actively traded on exchange and are typically distinguished by restricting the right to investment directly in the fund to a small number of institutional investors known as Authorised Participants or “APs” (known as the “primary market” – see further at paragraph 3) while at the same putting arrangements in place to promote secondary market trading. Because of this dual strategy of constraining primary dealing and encouraging secondary trading, ETF providers place APs in a position where they can profitably play a role which intermediates between the ETF and secondary market investors. These primary dealing arrangements have the effect of creating an incentive for APs to contribute substantially to secondary market liquidity, because they can generate returns either from the difference between the net asset value of the ETF and the aggregate price of underlying baskets of securities or from the bid-ask spread of ETF shares traded on the secondary market.
3. While ETFs deal directly with APs, retail, and other institutional investors access the ETF by trading on exchange or over-the-counter (“OTC”) (known together as the “secondary market”). Functionally therefore ETFs have a “tiered structure” in terms of investors. The first tier of this structure (known as the “primary market”) involves two specialisations: an

¹⁷ Madhavan, Ananth, (2016) *Exchange-Traded Funds and the New Dynamics of Investing* (Oxford University Press.

¹⁸ See below from paragraph 158 which discusses the effect of ETFs (rules-based investing) on underlying markets.

¹⁹ Similar insofar as investors create new shares by subscribing, and cancel shares by redeeming directly with the investment fund. Different insofar as it generally requires a process of delivery of securities (or arranging for the delivery of securities) in consideration for the issue of shares and also, because investors which deal directly with the ETF generally directly bear dealing costs.

²⁰ These processes result in market makers having the ability to manage their own inventory positions either by subscribing for, or redeeming ETF shares. This has significant implications in terms of the shape of the liquidity, and in turn impacts the nature of the risks related to ETF trading.

AP (which can deal with the ETF directly and which, relying on its capacity to create additional shares and to reduce the supply of such shares by offering them for redemption, rebalances supply of ETF shares to the secondary market²¹) and an Official Liquidity Provider (“OLP”) (which provides the market with a more conventional support to liquidity through two-way pricing on exchange (see further at paragraph 11)). The second tier is the secondary market investor which trades on exchange or OTC.

4. Schedule A provides a high level overview of an ETF’s dealing processes for information purposes.

Primary dealing

Authorised Participants

5. APs are commercial investors and have no legal obligation to create or redeem ETF shares.²² They have no duty to provide liquidity. APs are not obliged to trade on exchange. They are not remunerated by an ETF for dealing in ETF shares²³ and they are not “service providers” to the ETF as they owe neither responsibilities nor obligations to the ETF. In general, the primary source of revenue for an AP from ETF trading is the spread it achieves as a result of dealing in ETF shares in the secondary market. Primary market trades are carried out by the AP where this is more economically beneficial than dealing in the secondary market²⁴ and therefore operates as a unique, or near-unique, option to close out trading positions at the net asset value of the ETF. The basis on which APs deal with an ETF is solely a commercial one and in their own interests. Not only may they deal on their own account, but APs will also generally act in an agency capacity and place orders for ETF shares on behalf of clients.²⁵ APs, however, provide the only channel through which

²¹ Specifically, where an AP buys or sells shares in an ETF then it will need to ensure that its exposure to these deals is hedged. This may be achieved by purchasing or selling securities to which the ETF generates exposure or by entering into futures contracts. The “rebalancing” of underlying market exposures is achieved by the AP transferring securities to the ETF in return for ETF shares or by the AP delivering ETF shares to the ETF in return for underlying securities. In both instances the subscription and redemption mechanism closes out the hedge.

²² Antoniewicz, Rochelle and Heinrichs, Jane, (2014) *Understanding Exchange-Traded Funds: How ETFs Work* (Investment Company Institute. Research Perspective, Vol. 20, No 5, September 2014). Available at https://www.ny529advisor.com/blobcontent/908/179/1323398305717_ICI-RESEARCH-PERSPECTIVE.pdf. Also see BlackRock ViewPoint (2017) *A Primer on ETF Primary Trading and the Role of Authorized Participants*. Available at <https://www.blackrock.com/corporate/en-at/literature/whitepaper/viewpoint-etf-primary-trading-role-of-authorized-participants-march-2017.pdf>

²³ Antoniewicz, Rochelle and Heinrichs, Jane, (2014). Also see BlackRock ViewPoint (2017).. The CBI Survey confirmed that APs are not remunerated for their services by ETF providers or their group companies.

²⁴ Antoniewicz, Rochelle and Heinrichs, Jane, (2015) *The Role and Activities of Authorized Participants of Exchange-Traded Funds* (Investment Company Institute). Available at https://www.ici.org/pdf/ppr_15_aps_etfs.pdf. Mackintosh, Phil, (2014) *ETF Insights: ETFs Rarely Enter the Arb Zone* (KCG Market Commentary) also notes that, for US ETFs the arbitrage opportunity is limited with it being unprofitable for 90% of US equity ETFs.

²⁵ Antoniewicz, Rochelle and Heinrichs, Jane, (2014). Antoniewicz, Rochelle and Heinrichs, Jane, (2015). Also see BlackRock ViewPoint (2017).

new shares are issued and existing (or surplus) shares are redeemed by other market participants, who lack direct access to the primary market.

6. Assessing how important APs and OLPs are to the overall liquidity of an ETF appears somewhat complex. While having APs as well as OLPs constitutes a significant additional underpinning to market liquidity, observing this does not imply that AP or OLP trading will always characterise the bulk of ETF trading. US based research indicates that 90% of daily ETF trading is not dependent on the activities of APs.²⁶ However, this may not mean that APs are unimportant to the resilience of the liquidity of the ETF; it seems more likely that where there is primary trading overall levels of trading can come to be dominated by others during periods of robust liquidity. Even where the actual trading is dominated by others, the resilience of liquidity may, nevertheless, be due to the availability of the AP, in particular, to intervene when a profit opportunity presents itself.
7. While the impact of the existence of the AP on liquidity can be difficult to assess empirically, its impact on the cost base of the ETF is evident. Limiting APs to large institutional investors who trade in creation units²⁷ with the ETF enables the ETF provider to reduce the cost of administering an ETF and thereby to keep the ETF, relative to investment funds, cheaper. This is because APs will typically be fewer in number by comparison with the number of primary market counterparties any other investment fund will have, so the administrative cost of interacting with an AP will be lessened. Investment funds, by their nature (and to avoid cash drag), must in the case of a net dealing position,²⁸ deal in the underlying asset market in which they are investing. ETFs by comparison, because they only deal in creation units, (more often than not) do not have to deal directly in the underlying market as a result of the in-kind (or directed cash) primary dealing model (see further at Schedule A, paragraph 20). Where the AP engages in primary dealing with the ETF in cash, the size of the creation unit is sensible from an economies of scale perspective as it is more efficient to carry out larger trades than to place multiple, smaller ones (which would be the case if investors were able to deal in smaller amounts directly with the ETF). Another advantage of ETFs is the mechanism by which APs bear primary dealing costs arising as a result of a

²⁶ Antoniewicz, Rochelle and Heinrichs, Jane, (2015).

²⁷ ETFs set minimum dealing amounts for APs at a high level. This can be by reference to a fixed number of ETF shares (for example, 50,000 shares) or a minimum cash amount set at a similarly high level. The size of the creation unit is sensible from an economies of scale perspective. It is cheaper and easier to carry out larger trades. This large, pre-determined amount is known as a "creation unit." APs will subscribe for at least one creation unit directly with the ETF; this is known as a "creation." When redeeming, the AP will deliver ETF shares representing a creation unit back to the ETF. There are two ways in which a creation unit can be purchased by an AP; by the transfer to the ETF of a pre-determined basket of securities and cash (known as dealing "in-kind"), or by payment of cash in return for shares of the ETF. Similarly, on redemption, the ETF will deliver to the AP, either a pre-determined basket of securities and cash, or cash only in return for the re-delivery to the ETF of the creation unit. This is the only share dealing that takes place directly with the ETF.

²⁸ "net dealing position" refers to circumstances where there are net subscription orders or redemption orders in respect of a particular dealing day.

creation. This mechanism ensures that APs (and not the holders of ETF shares) bear the cost of acquiring portfolio securities.²⁹ These features are some of the reasons why ETFs limit the ability to directly deal with the ETF to APs.

8. APs for Irish domiciled ETFs are typically large broker-dealers, banks and high frequency trading houses and are generally regulated entities either in the EU or internationally. Acting as an AP does not, in itself, require an entity to be regulated as it is simply a term used to describe an eligible investor in an ETF. The CBI Survey ascertained that only one ETF had an unregulated entity as an AP and in that instance the AP was a related party to another regulated AP. However, the regulatory framework to which those APs are subject is not designed to regulate their activity as APs or to prevent them failing in that capacity.³⁰ Consequently, their regulatory status, if any, is not significant in assessing whether the restriction of primary dealing to APs creates additional risk.
9. In summary, then, APs have a purely commercial relationship with ETFs. Their impact on liquidity appears to be substantial but is not always easy to read in the empirical data. Their impact on the cost base of the ETF is evident. They are not regulated in their role as APs, but are usually regulated entities. In the remainder of this section a number of different potential parameters of risk with regard to the ETF dealing arrangements are considered.

Primary Dealing, Market Making and the build-up of ETF liquidity

10. The first consideration is the relationship between the AP, the OLP and other providers of liquidity. While an AP acts as the conduit through which ETF shares reach the market, an AP will not always provide market liquidity in the ETF. It is not obliged to trade in ETF shares.³¹ The impact of the role of the AP as an active manager of primary market supply is complicated by the fact that the AP also facilitates the provision of liquidity by acting as the mechanism through which OLPs and other market makers purchase ETF shares

²⁹ One of the key aims in the ETF dealing process is to avoid the dealing costs of acquiring or disposing of underlying securities, or the derivatives generating exposures (i.e. derivatives trades) which arise as a result of creations and redemptions. (This is distinct from the dealing costs borne by an ETF in the context of normal trading for example, portfolio rebalancing.) By comparison, in an investment fund, the investment manager will purchase underlying investments in response to daily cash flows from subscriptions for shares. The cost of purchasing these underlying investments (i.e. stamp duties, brokerage charges) will generally be borne by the investment fund. Similarly, where an investor redeems from an investment fund the investment manager will sell underlying investments in order to pay cash to the investor. If an ETF were to bear dealing costs in the same way as an investment fund, the ETF would experience "tracking error" because the methodology underlying the index being tracked by the ETF would not take account of the need to purchase and sell securities to reflect primary market deals. The performance of the ETF would therefore diverge from the performance of its index. For this reason, ETFs are structured so that dealing costs associated with creation and redemption activity are passed to the AP who can commercially bear the cost.

³⁰ While APs may be regulated as banking institutions or as broker-dealers, for example, the AP activity is not regulated *per se*.

³¹ Financial Stability Board (2017).

directly with the ETF. One area of interest is the relationship between APs and OLPs.

11. An OLP is a financial institution³² which undertakes to the stock exchange on which the ETF is listed to provide a certain amount of defined liquidity in an ETF.³³ Stock exchanges generally require a minimum of one OLP per ETF admitted to trading on that stock exchange.³⁴ The formal obligation of the OLP is (subject to certain exceptions)³⁵ to enter continuous two-way prices within a maximum spread and quote size for a specified period during the day. Like APs, OLPs do not owe an obligation to an ETF to provide liquidity even though the ETF will have procured the services of the OLP in order to obtain admission to trading on a regulated market. The commitment the OLP enters into is a commitment to the exchange in question, rather than to the ETF. The duties and obligations are provided to the exchange by the OLP in order to support functioning of the exchange (with the OLP often being compensated by the exchange through, for example, lower trading costs). This arrangement appears to provide a limited support to liquidity. The on-market liquidity within defined spreads in ETF shares provided by OLPs is subject to prevailing market conditions and is not guaranteed.³⁶
12. An ETF will, however, often enter into a separate commercial arrangement with an OLP in order to provide liquidity in an ETF. In these circumstances the ETF often remunerates or procures remuneration of the OLP for its services. The extent to which an arrangement between the ETF and OLP will provide additional support to liquidity, particularly in stressed market conditions, will be dependent on the terms of the agreement between the ETF and the OLP (which will, in turn depend on the commercial strength of the parties to the arrangement). The additional liquidity in ETF shares provided as a result of this arrangement appears limited, but it is relevant in the context of understanding the resilience of an ETF's liquidity and whether that depends on any significant details of the agreement.
13. An OLP is not required to be an AP. In practice, however, it is likely that OLPs will also be APs. The CBI Survey also indicated that a majority of OLPs are also APs. Where an OLP

³² OLPs can be described as “designated sponsors”, “market makers” or “specialists” on different exchanges. OLPs are not be directly remunerated by a stock exchange but will obtain different benefits from a stock exchange such as reductions in (or waiver of) trading costs in shares of the ETF in question.

³³ For example, the Exchange Traded Funds & Exchange Traded Products Segment of the Deutsche Börse AG require OLPs (known as “designated sponsors”) to maintain a minimum quotation volume which is tailored to the ETF in question. These can range from 700 shares to 100,000 shares. See document entitled “ETF & ETPs – Minimum Quotation Requirements” at <http://www.xetra.com/xetra-en/instruments/etf-exchange-traded-funds>.

³⁴ For example, the Irish Stock Exchange, London Stock Exchange, Borsa Italiana, Deutsche Börse, Euronext each require one OLP per listing.

³⁵ The terms of stock exchanges will generally permit the OLP to trade outside of spreads on the occurrence of certain events, i.e. market turbulence, suspension of underlying markets. Stock exchanges will also generally permit OLPs to terminate arrangements in relation to an ETF on relatively short notice to the exchange.

³⁶ A stock exchange will require an OLP to provide a minimum amount of liquidity within certain spreads. The actual demand in an ETF may be far in excess of that available from an OLP (because the OLP will only be committed to provide a certain amount of ETF shares within defined spreads).

is not an AP, the OLP will purchase ETF shares through an AP in order to fulfil its obligations to the exchange. It appears, then, that the OLP is probably best considered not as an independent support to ETF liquidity, but as an extension of the AP mechanism, because it has access through the AP to new shares or to redeem shares and thereby has an additional mechanism to help minimise risk in its market making role.

14. In the main APs and OLPs for Irish ETFs are independent of the ETF provider.³⁷ For some ETFs, APs are connected persons³⁸ to the ETF provider.
15. In addition to both the AP and the OLP, it is possible for other market participants to provide what constitutes an informal liquidity support role. Once an ETF is well established, liquidity in ETF shares will also be provided by institutional investors who are neither APs nor OLPs. Institutional investors may simply acquire ETF shares either on exchange, OTC or through an AP and continuously trade them, thereby supporting an active market. Having achieved a certain level of scale, other market participants (including retail investors) will trade in ETF shares either on or off exchange, thereby also creating liquidity in the ETF shares. This source of liquidity from active institutional traders in ETF shares has no direct dependence on the AP. How resilient this liquidity is will depend on the regulatory standing and trading objectives of the individual institution, but, in general, it seems reasonable not to see this liquidity as resilient. In other words, such informal supports to liquidity, even if important during periods of market confidence, are likely to be withdrawn during periods of stress if the liquidity of the ETF is called into question. Those providing this support to liquidity will not wish to be caught with open positions once the market situation suggests that their risk appetite is being exceeded.
16. In addition to such institutional traders, ETF trading is also likely to be undertaken by a number of other market participants who can add to liquidity. ETFs are increasingly being used by market participants in more innovative ways other than long term (“buy and hold”) investment. They are tools through which hedging strategies can be implemented, and they can be short term investments during the process of establishing longer term positions. They can be used as an alternative to futures and can represent a store of liquidity.³⁹ All this adds to liquidity in normal market conditions. These sources of liquidity are not directly

³⁷ Source: CBI Survey.

³⁸ A “connected person” is a management company, general partner, depositary, AIFM, investment manager, a delegate or a group company of any of these. See discussion at paragraph 104 on point. The CBI Survey showed, for example, that a large number of ETFs have APs which are connected persons to the ETF provider.

³⁹ See also Greenwich Associates (2017) *ETFs: Dynamic Tools for Institutional Portfolios* Available at <https://www.greenwich.com/asset-management/etfs-dynamic-tools-institutional-portfolios>. This survey “[shows] that institutional investors are turning to ETFs for liquidity, ease of use and fast access to exposures.” This survey indicated trends for institutional usage of ETFs among institutional investors noting their use for hedging and risk management, liquidity, strategic (i.e. to obtain exposure) and tactical (i.e. liquidity management) purposes.

dependent on the AP, rather they occur where there is a healthy range of buyers and sellers. It seems reasonable to consider these sources of liquidity as generally unlikely to be resilient but, on the contrary, to arise only because the ETF is already liquid.

17. Overall, we see that only some of the sources of liquidity are directly dependent on the AP (i.e. the activities of the AP and the OLP). Other parties who provide liquidity may trade with the AP, but do not need to do so. These other sources of liquidity seem likely to be less resilient than liquidity provided by the AP and/or the OLP, even though AP/OLP liquidity may not itself always be resilient. That would seem to suggest that regulators, when considering the risks that might be associated with the liquidity of ETFs, should focus on considering what might lead the AP or the OLP to withdraw from the market and what the implications of any connectedness between the AP and the OLP might be. There may be additional risk management considerations arising from the relationship between the AP and the OLP. For example, if there is a commercial relationship between an ETF and an OLP (which means that the OLP provides more than the exchange-defined minimum level of liquidity support to the ETF in circumstances where the AP is connected to the OLP) is there a possibility that the AP and a connected OLP could behave in ways which would have a sudden and damaging impact on the liquidity of the ETF? When regulators oversee the risk management activities of the ETF should they be looking at scenario analysis which considers this connectedness? If not, how much attention should regulators pay to AP-OLP connectedness?

Secondary Trading

18. The secondary market describes all trading that takes place other than directly with the ETF. It refers to both exchange-trading and OTC trading and is not different in any way from the trading and settlement of any other security traded on an exchange.
19. On-exchange trading will incur costs such as brokerage fees and commissions and an investor will either need to have a brokerage account or be capable itself of trading in ETF shares on exchange. However, it has the benefit which arises from being traded through a broker with a strong expectation of being fulfilled on a competitive, best execution, basis. On-exchange trading therefore means that trading in ETF shares benefits from the protection of a local regulatory environment which is transparent.
20. Alternatively, an investor can purchase ETF shares on an OTC basis. This means that investors can interact between themselves to trade in ETF shares. Whether an investor wishes to trade on exchange or OTC can often depend on the size of the trade that it wishes to place. The size of deals placed on an OTC basis are generally much larger than those

traded through exchange. The Central Bank understands that there are efficiencies to trading OTC (particularly for large deals) insofar as there are no exchange costs and investors can agree to trade any level of ETF shares (as opposed to being subject to minimum clip sizes in the case of exchange trading).

21. In Europe, ETFs are primarily traded OTC with estimates of between 50% and 90% of dealing in ETF shares occurring OTC.⁴⁰ It is not possible to obtain exact volumes as shares in ETFs are not currently subject to the same pre-and post-trade transparency obligations as other exchange traded instruments (although this will change under MiFID II⁴¹). Until this time, in general in Europe there is no requirement for OTC trades in ETF shares to be reported. Reporting may, however, be required as a result of admission to trading on a regulated market (for example the London Stock Exchange requires members to report trades in ETFs).
22. Once traded, ETFs must (like any other share) be settled between the trading counterparties.⁴² Shares in ETFs are recorded in book-entry form⁴³ in either an International Central Securities Depository⁴⁴ (an "ICSD") and / or in a Central Securities Depository (a "CSD").⁴⁵ They are then settled through securities settlement systems, and often cleared centrally through central clearing counterparties (like any other security). Irish ETFs traded on the Irish Stock Exchange ("ISE") are cleared through EUREX and settled through CREST (the CSD for Ireland and the UK). The manner in which shares of an ETF are settled and held are noted at Schedule A, paragraphs 10 - 13. The predominance of OTC trading appears, therefore to limit the ability of investors to understand the trends in

⁴⁰ BlackRock estimates that approximately 70% of ETF trades in Europe are OTC (May 2016): <http://www.ipe.com/reports/special-reports/etfs-guide-2016/addressing-current-liquidity-concerns/10013212.fullarticle>. Discussions with other market participants provided larger estimates. The AMF Study also estimates that in Europe a level of 70% of trading in ETF shares is OTC.

⁴¹ MiFID II will subject trades in ETFs to a post-trade reporting requirement.

⁴² Traditionally, settlement is unique to the secondary market and has not typically been present in non-traded UCITS (where ownership is transmitted through the primary market).

⁴³ Article 3 of Regulation 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories and amending Directives 98/26/EC and 2014/65/EU and Regulation (EU) No 236/2012 ("CSDR") requires an investment fund whose shares are "admitted to trading or traded on trading venues" to have these shares represented in book-entry form and settled through a securities settlement system.

⁴⁴ There are two ICSD in Europe, both of which hold banking licences; Clearstream Banking Luxembourg and Euroclear Bank, Belgium.

⁴⁵ Article 2(1) of CSDR defines a CSD as a legal person that operates a securities settlement system and which provides a CSDR "core service" in relation to a securities issue. A "core service" is either a notary service or a central maintenance service. Until relatively recently, shares in investment funds were not settled through CSDs on a cross-border basis, with settlement generally being possible in a domestic CSD between domestic counterparties who were transacting in domestic investment funds. For example, prior to 2016, settlement in (the local CSDs of) Euroclear France and Clearstream Banking Frankfurt was limited to trades within their local markets between counterparties, one of which were based in France / Germany. Since TARGET2-Securities (the European single settlement system under which payment transactions are settled one by one on a continuous basis, in central bank money with immediate finality) and migration to it of local CSDs and ICSDs it is envisaged that there will be a "rising proportion of the mutual funds issued and settled in Europe, both domestically and across borders" through CSDs. For further discussion, see ALFI and Fundsquare Market Infrastructure [T2S For Funds. Available at http://cooconnect.com/sites/default/files/T2S%20for%20funds%20round%20table%20discussion.pdf](http://cooconnect.com/sites/default/files/T2S%20for%20funds%20round%20table%20discussion.pdf)

trading of ETF shares that they are invested in or interested in investing in. We know that this situation will change under MIFID II, but it is difficult to predict what impact this might have on the behaviour of European ETF investors, if any.

Secondary market liquidity is dependent on the functioning of APs and OLPS

23. There are no rules or requirements relating to the number of APs who must be active in relation to an ETF. Neither are there, save as noted above (paragraph 11, in relation to OLPS) rules in relation to the numbers of liquidity providers which an ETF must have. The number of APs which are active in relation to an ETF will depend on demand for the ETF. Demand will depend both on the nature of the ETF and on its size. For example, depending on the exposure the ETF is seeking to deliver the AP will need to have particular trading skills. If the ETF is delivering fixed income exposure, the AP in question will need relevant expertise. It can also be expected that ETFs delivering broad market exposure will have more APs than those ETFs which do not.⁴⁶ Additionally, research has shown that larger ETFs have more active APs.⁴⁷ The only regulatory guidance available in relation to the need for minimum numbers of APs is derived from the MiFID II definition of “exchange traded fund”⁴⁸ which indicates that an ETF must have at least one market maker (however the market maker need not itself be an AP).
24. The results of the CBI Survey demonstrated that the number of APs approved for Irish authorised ETFs varied. Respondents indicated that they will only seek to have one. They also indicated that APs are contracted with the ETF provider on an “umbrella” basis (i.e. the APs contract with the umbrella ETF and are thereby authorised to deal in shares of any sub-fund ETFs). It is not therefore possible to specify with certainty that there are “typical” minimum numbers of APs which operate on a continuous basis for an individual ETF. Also, the identities of APs are not disclosed in ETF documentation or, in general, elsewhere. These results are consistent with research carried out by Antoniewicz and Heinrichs⁴⁹ who note that AP agreements are often entered into at an ETF provider level, rather than on a *per* ETF basis. They also note that AP agreements may be entered into on a speculative basis so that an institution can be in a position to deal in the ETF if it wishes to in the

⁴⁶ Noted also by BlackRock ViewPoint (2017).

⁴⁷ Antoniewicz, Rochelle and Heinrichs, Jane, (2015). The authors note that the number of active APs is “*directly related to the demand for their services.*”

⁴⁸ MiFID II Article 4(1)(46) defines an “exchange-traded fund” as a fund “*at least one unit or share class of which is traded throughout the day on at least one regulated market...with at least one market maker which takes action to ensure that the price of its units or shares does not vary significantly from its net asset value and, where applicable, from its indicative net asset value.*” The definition in MiFID II is derived from the definition of “UCITS ETF” in the ESMA Guidelines.

⁴⁹ Antoniewicz, Rochelle and Heinrichs, Jane, (2015).

future.⁵⁰

25. The possibility (however remote)⁵¹ of the absence of APs and / or OLPs has given rise to a concern about the impact this would have on secondary market investors. For example, it is unlikely that, in the absence of APs and / or OLPs, secondary market investors would be able consistently to sell holdings of ETF shares at a price that is close to the latest net asset value of ETF shares. In stressed market conditions or where idiosyncratic concerns arise, sales might take place only at a significant discount or premium.⁵² In these circumstances (and until the demand / supply was rebalanced by the re-entry of APs / OLPs to the market) ETFs would trade as (effectively) closed-ended funds.⁵³
26. This concern was expressed by the Financial Stability Board⁵⁴ where it was noted that economic self-interest motivates the activity of APs such that they traded when market circumstances were to their advantage. The FSB observed that

“[t]his could have potentially negative effects on the ability to trade without accepting significant discounts to the estimated value of the underlying assets if, for example, one or more APs were to pull back from the market in turbulent conditions.”

27. This concern is also reflected in the introduction of Rule 22e-4 by the SEC on 13 October 2016⁵⁵ which requires an ETF to consider the relationship between the liquidity of its portfolio and APs and other market makers in assessing its liquidity risk so as to avoid

“liquidity cost to the authorized participants or other market participants, which could increase the cost of their participation and interfere with their role in the ETF arbitrage mechanism, resulting in the ETF trading at increased bid-ask spreads and/or a premium or discount to its NAV and ultimately impacting investors.”

28. As the closeness with which an ETF's share price is to net asset value is, in the main, dependent on APs, who are not obliged to maintain a market presence, there may be a

⁵⁰ Noted also by BlackRock ViewPoint (2017). Here BlackRock notes that there is a distinction between APs which are authorised to transact directly with an ETF and “active APs” which actually trade.

⁵¹ The FSB noted that the potential for a stressed market environment where no AP remains is “a hypothetical situation with no historical occurrence.”

⁵² Sales in ETF shares could still take place OTC or on exchange. Where OTC then the price will be mutually agreed between the parties. Where sales take place on exchange then the market will determine the price. Of note is that some exchanges limit the extent to which the price of ETF shares can vary when compared to their net asset value. The utility of this is open to question given the extent of OTC trading in European ETFs.

⁵³ The possibility of ETFs trading as closed-ended funds was also noted by BlackRock ViewPoint (2017).

⁵⁴ Financial Stability Board (2017).

⁵⁵ Effective 2018 and available at <https://www.sec.gov/rules/final/2016/33-10233.pdf> at 269. The rule is designed to promote “effective liquidity management” thereby reducing the risk that investment funds will be unable to meet redemption demands.

concern that in the event of extreme market stress, retail and other secondary market investors could be effectively “stranded,” holding ETF shares which cannot be sold on the secondary market. Anticipation of this undesirable outcome could also lead secondary market investors to trade out of ETFs as stressed market conditions emerge, thereby adding to market instability.

29. As described above, a key feature of ETFs is that the primary dealing mechanism facilitates secondary market liquidity. In circumstances (however low the probability) where there are no willing buyers and sellers of ETFs (be those APs, OLPs, or other institutional or retail investors), the question is whether secondary market investors can or should be able to divest themselves of the ETF shares by direct redemption from the ETF. This is specifically an ETF-related concern: that the absence of direct access of secondary market investors to the primary market (in terms of creations and redemptions) means that if the AP mechanism fails the ETF becomes closed-ended until normal trading resumes. This concern is not relevant for other listed securities; investors are aware (and are implicitly willing) to take the risk that markets may be closed or liquidity may dry up temporarily during trading sessions. The risk is also not relevant to investors in investment funds which are not ETFs who bear a different risk – that of a suspension of primary dealing. Uniquely in the case of ETFs, it appears (if this analysis is correct) that liquidity risk is, in part, driven by risks to which an AP may be exposed, either because of its trading in the ETF shares or because of other unrelated exposures.
30. It is relevant to note two instances where an AP effectively stepped away from an ETF: those of Knight Trading Group, Inc. and Citigroup Inc.. In both instances, these APs were active and then ceased dealing with their respective ETFs. In both cases other APs had an economic incentive to step in and thereby facilitated creations and redemptions.⁵⁶ The more difficult scenario, for which it appears risk managers may need to prepare, is one in which other APs do not step in.
31. ETFs are sold as liquid, open-ended funds and there is a perception that their open-ended nature is copper-fastened. European ETFs are open-ended collective investment funds. Open-ended investment funds generally do not offer a guarantee of liquidity in all circumstances and have a variety of tools at their disposal in order to manage stress events

⁵⁶ Investment Company Institute, letter of 29 May 2015 to the Secretariat of the FSB in relation to the FSB's second consultative document on the Assessment Methodologies for Identifying Non-Bank Non-Issuer Global Systemically Important Financial Institutions. Letter is available at <http://www.fsb.org/wp-content/uploads/Investment-Company-Institute-ICI.pdf>. The Citigroup Inc., event was also cited by BlackRock ViewPoint (2017) where it noted that it was an example of “how the system can be self-correcting.”

which occur.⁵⁷ In the event an investor wishes to redeem and a stress event management tool is activated by an investment fund, all shareholders will be treated in the same way. Each will have access directly to the investment fund and will be subject to the same restrictions on redemption of shares. However, in the case of an ETF, only APs will have direct access. If APs face constraints on redemptions by the ETF, they may respond by ceasing their market interventions. Where ETF shares are also held by secondary market investors, they will face impaired secondary liquidity while having no access to primary dealing with the ETF. They may have to wait for the stress event liquidity management tool to be lifted in order to sell their shares to a redeeming AP (or alternatively, if there is active trading at the time, sell shares on the secondary market). There may, therefore, be a mismatch of expectation and thereby of risk appetite as between the operation of an ETF and the understanding of (particularly) retail investors. This scenario – in which the ETF constrains redemption access and the APs consequently withdraw from active trading (resulting in the market price of the ETF drifting away from the value of underlying assets held by the ETF) – seems to be a second significant scenario which regulators might wish to see ETF providers planning for. It would be interesting to understand whether and how ETF providers consider this risk and if they prepare for the consequences of a possible breakdown in the AP mechanism as part of their risk management tools.

32. This potential for ETF shares to trade at a significant premium or discount is a particular concern where the ability to access the ETF directly is only through largely discretionary channels. By way of example⁵⁸
 - a. a circa US\$16 billion Irish ETF giving equity exposure has 32 liquidity providers (31 APs none of which are connected persons to the ETF provider and 1 OLP which is not an AP);
 - b. a circa US\$2 billion Irish ETF giving emerging market exposure has 7 liquidity providers (1 AP which is a connected person to the ETF provider and 6 OLPs, none of which are APs); and
 - c. a newly established circa €30 million Irish ETF giving equity exposure which has 1 liquidity provider (the AP also acts as OLP and is not a connected person to the ETF provider).

It is not clear how many of the APs noted at (a) and (b) above are active and so the

⁵⁷ For examples of the tools available see IOSCO (2015) *Liquidity Management Tools in Collective Investment Schemes: Results from an IOSCO Committee 5 survey to members Final Report* (Available at <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD517.pdf>)

⁵⁸ Source: CBI Survey.

channels of availability to the ETF may be more limited. The results are, however, consistent with the research carried out by Antoniewicz and Heinrichs⁵⁹. A further complication in any risk assessment arises if these different events coincide (i.e. the outcome that arises if an ETF constrains redemptions in circumstances where the AP is a connected party with another significant contributor to ETF liquidity).

33. The indications from the CBI Survey are that, in the case of Irish ETFs the same large institutional investors act as APs and OLPs for the Irish ETF market as a whole. This concentration is even more pronounced in the case of synthetic ETFs (see further at paragraphs 84 et. seq).
34. Once such specific risk scenarios have been identified, ETF providers will need to consider appropriate tools for management of these risks. One obvious tool that would be specific to ETFs - one that appears to be envisaged in ESMA Guidelines⁶⁰ is opening up the primary dealing facility to holders of ETF shares who have procured them in the secondary market. While there may be practical difficulties with this (see further at Schedule A, paragraph 10 et. seq. 14) this would have the positive impact of allowing investors to redeem their investment directly with the ETF. Knowing that this option would be available – subject to the conditionality which attached to redemption of investments in all investment funds – could improve the stability of investment in ETFs by reducing investor fears that an ETF could become temporarily closed-ended because its AP mechanism had broken down. Without clarity on this matter, it can be anticipated that in times of market stress, investors in ETFs may deem the uncertainty attaching to whether there will be access to primary dealing with the ETF to be an unacceptable type of risk and may exit the ETF to avoid that uncertainty. Is it reasonable to consider that this could lead to a significant exit from ETFs, even in circumstances where the market perception of prospects for the AP or the underlying assets was not yet bad enough to justify such an exit (but merely indicated a cause for concern)?

ETFs – who are the shareholders?

35. Where an investor purchases ETF shares in the secondary market there could be a perception that the investor has direct rights and entitlements vis-à-vis the ETF including, for example, the ability to vote at meetings of the ETF. This may not however be the case due to the legal structure of the ETF and the manner in which shares are traded and settled. Investors are therefore likely to hold shares through nominee arrangements and as such will not have a direct right of access to the ETF (for further discussion on point see Schedule

⁵⁹ Antoniewicz, Rochelle and Heinrichs, Jane, (2015).

⁶⁰ ESMA Guidelines on ETFs and other UCITS issues ESMA/2014/937.

A, paragraphs 8-14).

36. A possible regulatory response to this is set out in the ESMA Guidelines⁶¹ which requires an ETF, in the event of market disruption, to offer a direct right of redemption to secondary market investors:

“(23) If the stock exchange value of the units or shares of the UCITS ETF significantly varies from its net asset value, investors who have acquired their units or shares (or, where applicable, any right to acquire a unit or share that was granted by way of distributing a respective unit or share) on the secondary market should be allowed to sell them directly back to the UCITS ETF. For example, this may apply in cases of market disruption such as the absence of a market maker. In such situations, information should be communicated to the regulated market indicating that the UCITS ETF is open for direct redemptions at the level of the UCITS ETF.

(24) A UCITS ETF should disclose in its prospectus the process to be followed by investors who purchased their units/shares on the secondary market should the circumstances described in [the previous paragraph] arise, as well as the potential costs involved. The costs should not be excessive.”

37. Furthermore, the Regulatory Technical Standards under MiFID II⁶² require regulated markets admitting ETFs to trading, in addition to market making arrangements, to take into account whether

“appropriate alternative arrangements for investors to redeem units or shares are provided at least in cases where the value of the units or shares significantly varies from the net asset value.”

when assessing whether units of ETFs are capable of being traded in a “fair, orderly and efficient manner.”

38. Given the legal and operational structures in place (and as noted in Schedule A), it seems that there is an inherent difficulty with the ESMA Guidelines and the draft MiFID Regulatory Technical Standards as the ultimate beneficial owner will not, most likely, be visible to the ETF. Additionally, the ETF as a legal entity, cannot ignore provisions of law which oblige it to recognise only the registered shareholder and cannot ignore the market infrastructure

⁶¹ ESMA Guidelines, page 7, paragraphs 23 and 24.

⁶² Article 4(2)(c), Commission Delegated Regulation (EU) 2017/568 supplementing Directive 2014/65/EU of the European Parliament and of the Council with regard to regulatory technical standards for the admission of financial instruments to trading on regulated markets. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2017:087:FULL&from=EN>

which governs the manner in which ETF shares are issued and traded. There may, therefore, be a disconnect between regulatory obligations and the legal and operational framework within which ETFs operate as companies.

39. The Central Bank would like to hear further from market participants on how, given the foregoing legal considerations, ETFs could facilitate a direct redemption from an entity with a beneficial interest in ETF shares.⁶³ It is also worthy of debate as to whether a requirement to remain open-ended rather than to trade on a *de facto* closed-ended basis in stressed market conditions is the desirable policy objective.

ETF traded price and net asset value gaps.

40. In a manner which is consistent with the nature of an ETF, pricing occurs at two principal levels; at primary dealing level and at secondary trading level. At primary dealing level, an AP will deal with an ETF in the same way as it would deal in any other investment fund, i.e. at the end of the day at the latest net asset value of the ETF. At secondary trading level, investors will deal in ETF shares at a spot market price formed by demand and supply, either on exchange or OTC.
41. It could be expected that the spot market price of the ETF will converge to a price which is close to⁶⁴ the aggregate (end of trading session) value of securities contained in the ETF's portfolio on that trading day. By analogy, it could be considered that the spot price of the ETF will constantly reference the value of the underlying constituents, valued at the spot prices, throughout the day. However, secondary market prices can be systematically different from the ETF's net asset value.
42. Shares in ETFs do not and are not expected to (other than in the primary dealing context) trade at net asset value. This is sensible, once it is acknowledged that market price formation depends on supply and demand, and that discrepancies between the spot price for ETF shares traded on exchange and the indicative net asset value (or "iNAV")⁶⁵ of the

⁶³ It is noted that an investor with a beneficial ownership in ETF shares could, by tracing through the chain of various nominee arrangements, arrange to have its interest redeemed by the ETF through an AP. Additionally, the Central Bank understands that in certain jurisdictions, the investment manager of the ETF would be encouraged to effectively "step in" and purchase the investor's interest in ETF shares. This is not the intention behind the ESMA Guidelines which envisage a direct redemption request from the investor being satisfied by the ETF.

⁶⁴ "close to" because the ETF will also have to accrue its ongoing management charge which is based on the value of portfolio securities and will also have to take into account any other costs or fees payable by, or to (i.e. in the case of securities lending) the ETF. Additionally, the cost of purchasing the ETF will have to be taken into account (i.e. spreads). The price of the ETF on the secondary market will never, therefore, be the same as the aggregate basket of securities underlying the ETF or the net asset value of the ETF itself.

⁶⁵ iNAV is an unofficial, real-time, calculation of the ETF's net asset value. Not all ETFs will publish an iNAV. Requirements for an iNAV are driven by the stock exchange on which the ETF is listed or traded. Certain exchanges publish iNAVs every 15 seconds. APs, OLPs and other market participants often calculate their own ETF iNAVs at a much increased

ETF constitutes a reference point to trigger such supply and demand. The difference between the two prices (either positive or negative, here termed the “premium/discount”) is “*expected to depend on the transaction costs and any other limits to arbitrage that might deter arbitrageurs from trying to profit from a mispricing*”.⁶⁶ There is, however, an assumption that the premium/discount is immaterial. As noted by Petajisto, the lack of focus by investors on the level of ETF premia/discounts implies there is an assumption of relative parity in pricing (and indeed there may be; for example in the context of an efficient market which does not depend solely on AP activity as the sole source of liquidity the spreads will tighten as the cost of dealing does not have to take into account any creation / redemption activity⁶⁷). It would therefore be surprising to them that there could be a significant deviance between the traded price of an ETF and its net asset value.

43. Petajisto’s research (a US-specific comprehensive analysis of the magnitude of ETF premia/discounts conducted across all US-listed ETFs, all underlying asset classes and over time) demonstrated an “economically significant” range in premium/discount.⁶⁸ Although premia/discounts are short lived (as they are subsequently reflected in the net asset value), factors contributing to them relate to the effectiveness of arbitrage and overall market risk. These factors are affected by matters such as pricing,⁶⁹ the fact underlying markets are closed during the ETF’s trading day,⁷⁰ the extent to which the cost of creation

frequency based on the information received in the portfolio composition file (in relation to the portfolio composition file see further at Schedule A, paragraph 27 et. seq.).

⁶⁶ Petajisto, Antti, (2017) *Inefficiencies in the Pricing of Exchange-Traded Funds* (Financial Analysts Journal, First Quarter 2017, 24-54). Available at <http://www.cfapubs.org/doi/pdf/10.2469/faj.v73.n1.7>

⁶⁷ Oppenheimer Funds, (2016) *The Right Way to Assess ETFs’ Liquidity*. Available at https://www.oppenheimerfunds.com/advisors/doc/The_Right_Way_to_Assess ETFs_Liquidity.pdf?dlq_asset_metrics=done

⁶⁸ Petajisto, Antti, (2017) found the following variation in premiums / discounts across asset classes: “*diversified US equities and US government bonds are fairly safe for investors, exhibiting volatilities of 10-20 bp around NAVs, whereas international equities exhibit volatilities of 50-130 bp around NAVs. Illiquid US-traded underlying securities such as long-term municipal bonds and corporate bonds also have volatilities of 50-160 bp around NAVs. Perhaps surprisingly, even some sector funds predominantly based on liquid US equities have volatilities of 30-70 bp.*”

⁶⁹ Pricing factors such as a difference in the time at which the net asset value of the ETF is calculated in comparison to the time at which the prices for underlying securities is taken. Tucker, Matthew and Laipply, Stephen, (2013) *Bond Market Price Discovery: Clarity Through the Lens of an Exchange* (The Journal of Portfolio Management, Winter 2013 49-62) illustrate this in the (US ETF) US fixed-income context. In this case the index prices will be taken at 3pm (ET) which is generally viewed as market close whereas some fixed income securities continue to trade after 3pm. Often the ETF will take the index price in order to calculate its net asset value. However, as ETFs are traded as equities they will continue to be traded until the exchange closes (at 4pm (ET)). Therefore, an ETF share which continues to trade on exchange after 3pm will capture a more recent price (than that in the index and, in turn the ETF’s net asset value) for underlying securities which, in turn, can result in a greater differential between the ETF’s net asset value and the exchange-traded price of the share.

⁷⁰ For example, markets in Asia would be closed during the US trading day. This results in APs possibly being unable to effectively hedge their position by purchasing relevant securities. APs will therefore build in this “risk” to the spread charge, also including additional factors such as liquidity in the underlying market. Research conducted by Calamia, Anna, Deville, Laurent, and Riva, Fabrice., The Provision of Liquidity in ETFs: Theory and Evidence from European Markets (1, August 2016). Available at SSRN: <https://ssrn.com/abstract=2835907> indicated that non-European ETFs (i.e. ETFs comprised of European-listed stocks) (as compared to European ETFs) displayed “significantly higher” spreads. There was “no evidence of a reliable relationship” between currency risk and spreads. Rather, there was an asynchronism between ETF and benchmark trading times.

or redemption is disproportionate to the value of an arbitrage⁷¹ and the liquidity of underlying securities.⁷² A further complicating factor, as noted by Madhavan and Sobczyk,⁷³ relates not to the spread, but to the fact that the net asset value published by ETF providers is not current but is based on “past prices” which do not envisage adjustment for subsequent market events (other than in a “fair valuation” scenario). Therefore, for example, the traded price of bond funds (which can trade with relative infrequency) and funds whose underlyings trade during different market hours to the ETF will exhibit staleness (evidenced by greater spreads) and greater return volatility by comparison to the net asset value. Any adjustments must, therefore, be reflected in market traded prices and in iNAVs.

44. The outcome of this, as noted by Petajisto, is that *“the actual prices faced by ETF investors can differ significantly from the [ETF’s net asset value], thus presenting a potentially large hidden cost for ETF investors.”*
45. It may therefore be difficult for an investor to understand whether the total cost of purchasing an ETF represents good value. Investors are likely to believe that the price at which an ETF is purchased or sold is close to the combined value of assets represented by the ETF share. It is possible that investors may not appreciate that they will have to pay a spread which might result in the cost of acquisition of the ETF being comparatively expensive in addition to other trading-related costs (which will be incurred as part of any market dealing).
46. There is no regulation either in the European Union, or elsewhere which requires an ETF to take measures to ensure that the exchange-traded price is close to net asset value. However, in the case of UCITS ETFs there is an expectation (but not a rule) that ETFs will trade on the secondary market at a price which is close to net asset value. The expectation is reflected in the MiFID II definition of “exchange traded fund” which indicates that an ETF will have at least one market maker

“which takes action to ensure that the stock exchange value of its units or shares does not significantly vary from its net asset value and where applicable its indicative net asset value.”

⁷¹ Petajisto’s research has noted the economic inefficiency of some arbitrage trades noting that an AP would need several days to accumulate a position which would offset the creation or redemption cost resulting in a timing risk for the AP.

⁷² The more liquid, the less arbitrage opportunities exist and conversely, the more illiquid, less transparent a market is, the more arbitrage opportunities exist.

⁷³ Madhavan, Ananth and Sobczyk Aleksander, (2016) *Price Dynamics and Liquidity of Exchange-Traded Funds* (Journal of Investment Management 14.2: 86-102).

47. An earlier version of the UCITS Directive, however, indicated that a deviation of more than 5% from net asset value would be “significant.”⁷⁴ The extent to which a UCITS ETF can prevent its exchange-traded share price from deviating from its net asset value is very limited. However, ETF providers who have an interest in retaining a listed share price which is consistent with the net asset value can, as previously noted, contractually agree with OLPs (or other market makers) that they maintain spreads at a particular level for a defined number of shares.
48. Individual stock exchanges often play a role as they impose rules relating to minimum and maximum spreads on the OLP acting for an ETF thereby limiting any divergence between the net asset value of ETF shares and their traded price. The recent AMF Study points out that Euronext circuit breaker mechanisms provides short term limits on price variations which prevents ETF prices from varying by more than +/-1.5% or, at the discretion of the ETF provider, 3%. This rule is motivated by a desire to limit intra-day volatility in ETF prices by reference to the latest iNAV (rather than by a desire to keep traded prices close to net asset value).
49. Where investors are not aware of the real-time value of assets in an ETF's portfolio (in the same way that, for example, an AP can be as it will receive details from the ETF, in the form of a portfolio composition file (see further at Schedule A, paragraphs 27 *et seq.*) at the beginning of each trading day which will enable it to price the fair value of the ETF) it will be difficult for them to assess value. This is addressed, to a certain extent in the US where US ETFs are required to publish an iNAV. There is no similar regulatory requirement for ETFs but the requirement to publish an iNAV may be imposed by stock exchanges as a condition of listing (for example, the Deutsche Börse, the Borsa Italiana and Euronext require ETFs to publish an iNAV) with details of the iNAV being available on the relevant stock exchange's website.
50. In the case of a normal listed security the concept of an iNAV is almost meaningless due to the intangible and/or untraded nature of many of the most valuable assets of an ordinary commercial company. This means the spot market price is the best collective estimate of the instant valuation of the company. In a trading context, a fair price is achieved by imposing best execution rules, i.e. by ensuring that investors get the best available price. It is noteworthy that in the case of some normal listed securities, where underlying assets are capable of being given a valuation, commentators will often note the difference between the balance sheet value and the market prices. These commentaries, however, will never

⁷⁴ This was in the context of funds which did not have a depositary but were (a) actively traded on a stock exchange and (b) who were required to intervene on the market (through an intermediary appointed by the UCITS) to prevent the stock-exchange value from deviating by more than 5% of their net asset value. This provision was deleted under UCITS V.

attain the certainty attaching to an iNAV and as such, in the absence of a “true value” for a normal traded security, best execution delivers the best possible estimate of its value.

51. ETFs are different in this respect. As UCITS they usually represent ownership of a portfolio of easy-to-value securities, all of which have a calculable market price. Fair value pricing of an ETF can be achieved by reference to the market price of an ETF's portfolio holdings which is (generally) public and accessible like any other real time market price. Consequently, whereas in the context of normally traded securities, the fair price is subjective, in the context of an ETF it is capable of being objectively calculated and is something investors are likely to expect to achieve on sale of their ETF shares.
52. iNAVs may have flaws due to, for example, stale pricing because of illiquidity, or differences in time-zones and the fact they may not be published at sufficient frequency for professional traders. They do, however, appear to represent one way in which an investor will be able to benchmark the exchange-traded price as against the value of the ETF's portfolio.
53. The Central Bank's current understanding is that ETFs publicly disclose their portfolios daily and this transparency has been considered necessary for effective arbitrage (which enables the exchange-traded price of an ETF to remain close to its net asset value⁷⁵). In addition, portfolio transparency allows investors to understand what an ETF is exposed to on an ongoing basis.
54. While the Central Bank's current expectation is that the ETF's portfolio is disclosed on a daily basis,⁷⁶ it does not have a rule on this. The ESMA Guidelines only require a UCITS ETF to disclose in prospectus and other documentation its

“(17) ...policy regarding portfolio transparency and where information on the portfolio may be obtained, including where the indicative net asset value, if applicable, is published.”

55. Instead, portfolio transparency is a matter governed by rules (if any) imposed by the stock exchange on which the ETF is listed or admitted to trading. There is, however, no consistency in these disclosure rules across Europe, with requirements varying on a per-exchange basis. For example:

⁷⁵ Typically, in an index tracking ETF, the ETF publishes its portfolio on a daily basis. This can be achieved through publication on a web-site or through publication of a holding or pricing basket in the portfolio composition file. This information is generally disseminated to the market via data vendors but may also be directly to APs by the ETF. This information is used by the AP to calculate its fair value of the ETF and thereby to price market trades in the ETF shares.

⁷⁶ See Central Bank Q&A ID 1012 which provides that “the Central Bank will not authorise an ETF, including an active ETF, unless arrangements are put in place to ensure that information is provided on a daily basis regarding the identities and quantities of portfolio holdings. The arrangements must be disclosed in the prospectus.” See http://www.centralbank.ie/regulation/industry-sectors/funds/ucits/Documents/161219_UCITS%20QA%20NO%2015%20FINAL_CC.pdf

Stock Exchange**Portfolio disclosure required**

Irish Stock Exchange

No (for both active and index tracking ETFs).

London Stock Exchange

No (for both active and index tracking ETFs).

Deutsche Börse

Yes (all ETFs to disclose top 20 positions on a daily basis and on a monthly basis disclose full portfolio with a 1-month delay).

Borsa Italiana

No (for index tracking ETFs). For active ETFs, the portfolio must be made available at least once a day.

Euronext

Yes, daily.

Swiss Stock Exchange

Yes (full portfolio disclosure with maximum 4-week delay).

BATS Europe

No.

56. The Central Bank understands that it may be possible for an ETF which does not publicly disclose portfolio holdings to reach an operational solution which still creates an incentive for traded prices to remain close to the ETF's net asset value. In essence, the ETF must ensure that APs have sufficient information to trade (both with the ETF and to provide an on-exchange price). The Central Bank has identified two different approaches which seek to ensure this. In one example there is full portfolio disclosure to a single or limited number of APs. Another uses an index or other proxy for the ETF's portfolio. There are interesting studies which appear to demonstrate that these approaches may in fact be more effective than full daily portfolio transparency (see further at paragraph 137 et. seq.).
57. Overall, there may be a case for policy makers to seek to identify the optimal way (or ways) for information about the ETF portfolio to be published in such a way as to facilitate accurate secondary market pricing of shares. Alternatively, this matter might be left to stock exchanges or to the ETFs themselves. If that is done, regulation could either remain silent on the matter or could place a general obligation on ETF providers to take appropriate steps to provide optimal disclosure having regard to their particular investor base, their investment strategy and the profile of secondary market trading.

Share Classes

58. ETFs, similar to other UCITS, can be established having one, or a number, of share classes. All share classes participate in the same pool of assets of the ETF but may have different distinguishing features. UCITS share classes can be distinguished by reference to currency of denomination, fees, distribution methodology and hedging methodology.
59. The Central Bank (Supervision and Enforcement) Act 2013 (section 48(1)) (Undertakings for Collective Investment in Transferable Securities) Regulations 2015 ("CBI UCITS Regulations") require shareholders in the same share class in an investment fund to be treated equally and fairly. Shareholders in different classes in the same investment fund

must be treated fairly.⁷⁷

Different dealing deadlines for hedged and unhedged share classes

60. One of the Central Bank's fundamental principles for investment funds is that dealing deadlines (i.e. the time by which an investment fund must receive a subscription request or a redemption instruction) must be the same for all share classes. A dealing deadline must also occur before the investment fund's valuation point (which is the point in time by reference to which assets of the investment fund are valued and is typically close in time to closure of the underlying market). Departure from this principle is granted only on an exceptional basis and on receipt of a detailed submission which outlines the necessity for any such departure.
61. In an ETF context, the Central Bank has been requested to differentiate between the requirements of an AP which deals with an ETF on a cash or on an in kind basis. APs who deal with the ETF on a cash basis are subject to an earlier dealing deadline than APs who deal with the ETF on an in-kind basis. The Central Bank has permitted this in recognition of the fact that dealing with an ETF on a cash basis attracts different considerations to dealing on an in-kind basis.
62. In the case of a creation, where an ETF deals on an in-kind basis, the ETF will not have to purchase securities in the underlying market as the AP will deliver securities to the ETF in return for shares in the ETF. This means that the AP who wishes to invest in the ETF can have a dealing deadline which is as close as possible to the ETF's valuation point. The AP can continue to purchase underlying securities during the dealing day and, in turn, transfer these to the ETF in return for shares.
63. In the case of cash dealing however, the ETF will receive cash from the AP. If the ETF did not invest the cash in the underlying market this would cause "cash drag" thereby increasing the ETF's tracking error. To avoid this, the ETF will need time to enter the market and place deals for underlying securities (with a value representing the creation unit). This means that the AP will have to deliver cash to the ETF earlier in the day as UCITS are not permitted to place trades in the market without having cash to cover them.
64. The difference in dealing deadlines for cash and in-kind dealing mechanisms permits an AP dealing on an in-kind basis to deal in the ETF as close as possible to the close of the underlying market. If this AP was subject to an earlier dealing deadline⁷⁸ it might not be

⁷⁷ CBI UCITS Regulations, Regulation 26(1)(d).

⁷⁸ For example, where the Central Bank did not permit different dealing deadlines for different subscription models.

able to effectively hedge its own exposure and could decide to invest elsewhere, thereby placing the ETF at a commercial disadvantage. Additionally, if the AP was unable to effectively hedge its exposure (or if there were other negative implications of the earlier dealing deadline), it could be expected that this uncertainty would be “priced” into the spread at which the ETF shares are traded by the AP. Secondary market investors would therefore be negatively impacted.

65. For an AP dealing on a cash basis, the earlier cut-off both facilitates the ETF achieving the best execution possible in purchasing underlying securities and enables effective sampling or replication.
66. From a best execution perspective, the ETF will be concerned to achieve the best possible result when dealing in underlying securities. This is because dealing costs are borne directly by the AP.⁷⁹ If, therefore, trading earlier (or in a more systematic, less rushed manner) results in comparably lower dealing costs then this will result in the AP bearing lower dealing costs. As dealing costs are priced into the spread charged by the AP, secondary market investors are negatively impacted if the AP has higher dealing costs (with the converse also being the case – lower AP dealing costs can contribute to lower spreads).
67. Where an ETF seeks to achieve its objective through effective sampling or replication, additional time will be necessary for cash based deals. This is because where an ETF has a sampling strategy, or uses other (non-index) securities or investments to replicate an index, then it will need time to ensure that the sampling or substitute securities achieve the desired outcome.
68. The difference in dealing deadlines is reflective of commercial considerations of both the ETF and of the APs who deal with the ETF. As APs are the primary conduit through which liquidity is provided, their commercial needs will be a factor in the ETF “build” process in order to facilitate the ETF growing to scale.
69. To date, the Central Bank has only approved differences in deadlines for ETFs which deal on a cash basis and in-kind basis. There may, however, be other circumstances which might necessitate consideration of different dealing deadlines within a single ETF. One example might be an ETF which has a hedged share class with currency hedging being

⁷⁹ Therefore, two ETFs delivering the same exposure could be comparably more, or less, expensive for an AP to deal in because of the cost of dealing in underlying securities. Also, see further Schedule A, paragraph 17 which discusses how APs bear dealing costs.

implemented using a currency hedged index (which is a hedged version of the index being used by the ETF and which reflects the foreign exchange rate at the fixing time⁸⁰). In these circumstances the ETF will have at least two share classes; one which tracks the (unhedged) index and the other which implements a currency hedging strategy by reference to the hedged index methodology.

70. In order therefore to facilitate optimal tracking of the currency hedge within the index, the ETF should place currency hedge trades at, or as close as possible to, the time it is reflected in the index. If the fixing time is 4pm then the ETF will need sufficient time to place the trades and, as such, is likely to need a dealing deadline which is earlier than 4pm. An unhedged share class would not be subject to the same considerations and so, in practice, could have a later dealing deadline.
71. It might be that the same factors as noted above for cash and in-kind dealing apply to hedged and unhedged currency share classes in ETFs.

ETF/non-ETF share classes

72. There has been recent discussion about the ability of a UCITS ETF to establish share classes which are “unlisted” (i.e. a non-ETF share class) or of the ability of a non-ETF UCITS to establish an ETF share class, which – from a regulatory perspective – amounts to the same outcome. What this would involve would be establishing a UCITS fund which had at least two share classes, one of which would conduct primary dealing only with APs and the other of which would accept subscriptions and accept redemption requests from any holder of the shares. Notwithstanding these differences in redemption rights, the two share classes would co-exist within a single fund pursuing a single investment strategy.
73. UCITS ETFs are defined by the ESMA Guidelines as a “*UCITS at least one unit or share class of which is traded throughout the day on at least one regulated market or Multilateral Trading Facility.*” The possibility to establish a UCITS which has both listed (ETF) and unlisted (non-ETF) share classes is not, therefore, excluded by the definition.⁸¹
74. While the existence of “listed” and “unlisted” share classes in a UCITS ETF is operationally

⁸⁰ The “fixing time” is the time at which an exchange rate is set. Often the WM/Reuters London 4pm Fix is used. This provides a standard exchange rate which is used to assess the value of portfolios at a defined time on a particular day. The fixing time for the WM/Reuters London 4pm Fix is slightly after 4pm.

⁸¹ However, the same is not necessarily the case for an investment fund which wishes to establish both listed and unlisted share classes. It appears, from the definition, that should an investment fund establish a listed share class it would fall immediately to be categorised as a UCITS ETF.

possible, there are questions as to whether this type of UCITS enables investors⁸² to be treated fairly. The concern would be that shares issued into the “listed” share class will be traded by APs to secondary market investors who do not have access to the redemption facilities which are available to holders of shares in the “unlisted” share class. This seems only to be a concern in stressed market conditions. In those circumstances, there may be a period of days during which the ETF redeems shares at net asset value but the secondary trading prices have diverged from the corresponding net asset value. In that particular situation, members of the “listed” share class will be at an apparent disadvantage to members of the “unlisted” share class. The latter will be able to redeem from the fund, the former will not, although the holders of shares issued from both share classes are all investors in a single investment fund. There is a question as to whether this can constitute “fair” treatment of all investors. (Formally, the inverse problem also arises, i.e. the members of the “listed” share class have access during normal liquidity periods to secondary market, intra-day trading opportunities to which the members of the “unlisted” share class do not have access.) In such a scenario, the “unlisted share class(es)” can deal only with the UCITS at net asset value at end of day and do not have a secondary market trade-ability). The listed share class(es) can deal directly with the UCITS at net asset value at end of day but can also be traded (either on-exchange or OTC) on an intra-day basis. While this might also be unfair, it appears to be less likely to be damaging in unacceptable ways.

75. The concern about the shareholders of the “listed” class not having access to primary dealing arrangements to which the “unlisted” class does have access to is about fairness of treatment. Views are requested as to how it can constitute fair treatment of two different holders of shares in an ETF to allow one access to a primary dealing facility which is unavailable to the other.
76. There is a second potential issue of “fairness” which the Central Bank wishes to raise for discussion namely, the ability of holders of listed and unlisted shares to divest themselves of shares on an intra-day basis. Whereas the first issue concerned the possibility that the holders of the listed share class might suffer some unacceptable unfairness in stressed market conditions because they did not have access to primary dealing, this second issue concerns the possibility that holders of the unlisted share class might suffer an unacceptable unfairness because they did not have access to secondary trading (notwithstanding the investor chose to invest in the “unlisted” share class rather than in the “listed” share class).

⁸² Reference to “investor” (as opposed to “shareholder”) is intentional and is reflective of the fact that very few investors will become shareholders (i.e. on the shareholder register), not because they choose to structure an investment in ETF shares in a particular manner, but because of the nature of an ETF. While an Irish ETF is subject to those restrictions noted below at Schedule A, paragraph 8 the ETF is not structured to be held directly by beneficial owners. Rather it is designed to facilitate an easy and frequent transfer of ownership interests.

77. As noted previously, it is a general feature of ETFs that the ownership of listed shares can be transferred between investors on an intra-day basis. The constitutional documents, the prospectus and the primary dealing and settlement arrangements of these shares are all designed to not only allow, but promote, such intra-day transfers of ownership. This contrasts with the position in relation to other non-ETF investment fund shares. In general, shares of non-ETF investment funds (of the type generally established in Ireland), limit the ability of shareholders to transfer shares to third parties. This is achieved by specifying in the constitutional documentation of the investment fund that the approval of the investment fund for any such transfer is required.⁸³ While, in theory, this does not amount to a strict prohibition on the transfer of shares in such an investment fund, it makes it impractical to complete intra-day. For these investment funds, there is no advantage for investors to trading with another party rather than seeking to redeem from the investment fund at the end of the day.
78. In discussions with industry on how an ETF might operate if it had both listed and unlisted share classes, there appears to be a working assumption that dealing in an unlisted share class would operate in the same way as dealing in shares of a non-ETF investment fund would operate. In other words, approval would be required to effect a transfer of shares between a shareholder and a counterparty. If this were accepted by regulators, the result would be that in a stressed market scenario listed shares could be sold on the secondary market to other participants as the situation deteriorated during the trading day. It would, however, be impractical for holders of the “unlisted” share class to do so because they would need the approval of the ETF to conclude a transfer. The holders of unlisted shares would not be in a position to transfer their shares on an intra-day basis, but would have to wait to redeem with the ETF at the next calculated net asset value. This could give the holders of the listed share class a short term advantage in being able to close out an exposure during the day, whereas the holders of the unlisted share class could not do so until the end of the day. The “unfairness” (if such it is) could extend beyond the end of the day, if the ETF suspended redemptions but, for whatever reason, secondary market trading continued (although a suspension of redemptions by the ETF would also be likely to impact secondary market trading).
79. Perhaps if regulators were only to approve ETFs with listed and unlisted share classes on condition that the unlisted share class could be transferred without the need for ETF approval, this situation - where only one class of shares must wait for the end of the day dealing - could be avoided. In practice, if regulators were to require this, evidence that the

⁸³ These restrictions are generally in place to ensure that the transferee will complete a fund application form and complete anti-money laundering due diligence. The exact process for any such transfer will be determined by the constitutional documentation and prospectus of the investment fund.

unlisted shares were issued into and settled within a securities settlement system (thereby being capable of transfer between participants on an intra-day basis) might demonstrate that the apparent unfairness had been effectively eliminated.

80. Is there an “unfairness” here that could be addressed by arranging for unlisted shares to be issued into and settled in a settlement system? Views are requested as to whether this is proportionate and whether there could be undesirable consequences arising from such a proposal?

Section I Questions

In addition to the questions posed above (and in addition to any observations Stakeholders may have generally), the Central Bank poses the following specific questions:

- A. Is public disclosure of the identity of APs and OLPs of an ETF of benefit and should regulators have a clearer view of the interconnectedness of the AP / OLP ecosystem? Should remuneration models of OLPs (and if relevant APs) be disclosed?
- B. Transparency is described as the feature which enables a tight secondary market price (by comparison to net asset value) to be maintained. It also provides certainty to investors in terms of exposure achieved through the ETF. It might be the case that there are other mechanisms which achieve the same goal as transparency? If ETFs are not transparent does this have unintended consequences?
- C. Is the idea of secondary market investors dealing directly with an ETF when the AP arrangements breakdown unworkable in practice or unnecessary? Is there a better way of enabling secondary market investors to dispose of their ETF shares at a price close to the next calculated net asset value when secondary market liquidity is impaired?
- D. Should ETFs warn investors that the ETF may temporarily become a closed-ended fund in certain market conditions? Would requiring an ETF to remain open-ended in a stressed market be disadvantageous to existing investors or have other unintended consequences?
- E. Is it correct to permit share classes to be structured having regard to the operational concerns of APs and the impact this may have on secondary market pricing? Are

there factors (other than those noted above) that could be relevant to ETF structuring?

- F. What are the benefits or disadvantages of permitting listed and unlisted share classes within the same investment fund? Do listed and unlisted share classes create unfairness as between investors in the same investment fund and if so, can these be mitigated or addressed?

Section II: Distinctive ETF risk factors

81. The previous section, having examined the distinctive dealing arrangements characteristic of ETFs, has identified APs as a key feature of an ETF's ability to function (and thereby a key risk in the ETF's operation). This section considers how AP risk can interact with other types of risk assumed by an ETF. ETFs are structured so as to deliver investment return from an underlying portfolio through either physical investment, through synthetic exposure or from a combination of both. While not all ETFs are the same, in general the strategy is to invest on a rules-based approach in order to deliver an index return. This section considers whether the combination of AP risk with risks arising, either from investment strategy or the ETF structure, may have a compounding effect. The key risks identified here for discussion are the connectedness between the AP and collateral counterparties and the extent of any increased collateral risk arising from synthetic strategies.

AP Interdependencies

82. A key distinctive feature of ETFs appears to be the structure and character of their counterparty risk profile. All investment funds, and indeed all investors, face counterparty risk because they enter financial transactions. Consequently, all investment funds have a risk profile. This is entirely appropriate. Without taking on risk, they could not achieve reward for their investors. The questions considered here are focused on whether there are some distinctive features of the risk profile of ETFs. To the extent that there is such a distinctive profile, it does not imply that the level of risk in an ETF is higher, just that its profile is different and, therefore, risk managers and regulators should have a somewhat different focus.
83. ETFs, as they were originally structured, were physical ETFs in that their portfolio consisted of "physical" investments (by which is meant that the ETF held ownership of issued securities such as bonds or equities or real assets such as commodities or real estate). Physical ETFs are still the dominant European ETF model and remain the dominant model for ETFs globally. In addition to holding "physical" assets, physical ETFs can also enter into derivative transactions for ancillary purposes; for example, currency hedging (at either portfolio or share class level) or to generate exposures to securities in an efficient manner. These activities generate counterparty risk. Counterparty risk exposure is slightly different for physical ETFs which also enter into secured financing transactions (such as reverse / repurchase agreements and securities lending transactions ("SFTs")) to enhance returns. Where a physical ETF transfers a portion of its portfolio (whether by way of securities lending, repurchase agreement or reverse repurchase agreement), it will be exposed to

counterparty risk in a slightly different way than if it did not do so. As noted previously, in the event that an AP and a counterparty are connected in any way, the overall risk profile of the ETF appears to be multiplied. Therefore the typical counterparty risk profile of a physical ETF could be seen as consisting of (a) the risk inherent in investment (i.e. to the risk of issuers of securities invested in by the ETF), (b) the counterparty risk associated with hedging or other efficient portfolio management activities, (c) the counterparty risk associated with yield-enhancing SFTs and (d) the additional or multiplied counterparty risks arising from any connection between an AP and a counterparty.

Synthetic ETFs

84. This apparent multiplication of risk exposure due to connectedness between APs and counterparties appears to be more significant in the case of synthetic ETFs. It is often suggested that synthetic ETFs can, in addition to being able to deliver “tighter” tracking to broad market indices, efficiently deliver “hard to access” exposures, for example to commodities or to emerging markets and can be used *“where physical replication remains either technically or financially unfeasible.”*⁸⁴ Nevertheless synthetic ETFs have declined in popularity in recent years.⁸⁵
85. Synthetic ETFs seek to generate a return using derivatives as the central instrument of their investment strategy. Generally, the ETF will enter into a swap agreement whereby it will receive the return of its underlying index from a swap counterparty in exchange for paying out an agreed return to the swap counterparty. While the models and types of derivatives that can be used in a synthetic ETF can vary, total return swaps are typical. Synthetic ETFs therefore face substantial counterparty risk exposure. The focus here is whether the adoption of synthetic strategies by ETFs adds to the AP risk which is inherent in the ETF model.
86. To discuss this, we focus on synthetic ETFs using total return swaps. Synthetic ETFs using total return swaps generally take one of two forms; the funded model and the unfunded model (which is the more usual).⁸⁶

⁸⁴ Morningstar Manager Research (2017) *A Guided Tour of the European ETF Marketplace* Available at <http://media.morningstar.com/uk/MEDIA/ETF/AGuidedTouroftheEuropeanETFMarketplace2017.pdf>.

⁸⁵ Synthetic ETFs while being a relatively recent development and initially being a popular structure for ETFs “are increasingly treated as secondary options from an ETF product development standpoint.” See, Morningstar Manager Research (2017) where Morningstar notes in a European context that “the shift from synthetic to physical replication continues, with assets in physically replicated exchange-traded products...[i.e. both ETFs and other types of exchange-traded products]...now representing 77% of the market, up from 66% three years ago.”

⁸⁶ The prevalence of the unfunded swap model appears to reflect the target investors of the ETF as the funded swap structure results in the ETF essentially being undesirable (by comparison) for French and Swiss investors. The Central Bank understands for example, in a French context, to be eligible for the French equity savings plan, the Plan d'Epargne en Actions (“PEA”), investment funds must invest at least 75% of their assets in eligible securities and rights (i.e. those

87. In a funded swap model, an ETF transfers cash representing the proceeds of a creation (subscription) to the swap counterparty in return for the index performance (and ultimately the return of the cash once the swap arrangement is closed out). To manage counterparty exposure, the counterparty pledges collateral assets which must be held either with the depositary of the ETF or in a segregated account with a third party custodian (which is subject to prudential supervision and is unrelated to the provider of the collateral).⁸⁷ As the collateral is required to be subjected to a haircut, it is to be expected that the funded swap will be over-collateralised.
88. There is a second, unfunded, swap model in which the ETF also enters into a swap with a counterparty but with different arrangements. At the same time as it enters into the swap the ETF purchases a basket of securities (which, it is suggested in academic literature⁸⁸ are typically bought from the counterparty itself or from an entity related to the counterparty). If the swap counterparty fails, the ETF can sell the basket of securities thereby limiting its loss. The counterparty delivers the index return to the ETF in exchange for the ETF delivering to the counterparty the return generated by the basket of securities.
89. Where a synthetic ETF receives collateral as part of the swap structure it is exposed to the possibility that either the collateral received or the securities it has purchased will be insufficient in the event of counterparty default.
90. Irrespective of the structure used, a synthetic ETF will be dependent on its swap counterparty to deliver the relevant return. As has been noted,

“Fund investors are relying on one or multiple counterparties to provide them with the performance of the fund’s reference index. Should a counterparty default, fund shareholders face the risk of permanent capital impairment.”⁸⁹

issued by companies established in a Member State of the European Union or in Iceland and Norway which are subject to corporate income, or an equivalent, tax). As the collateral of an unfunded swap can be comprised of PEA eligible investments, the exposure delivered by the ETF (an Asian exposure, for example) will not adversely affect the PEA eligibility of the ETF. Additionally, from a Swiss perspective, the FINMA’s Newsletter on ETFs of 2011 raised a number of issues arising from use of the funded swap model, questioning the extent to which such an ETF met the criteria for categorisation as an open-ended collective investment scheme. This pronouncement, the Central Bank understands, created a further disincentive for ETF providers using the funded swap model.

⁸⁷ ESMA Guidelines, page 7, paragraph 43(g).

⁸⁸ Ramaswamy, Srichander (2011), *Market Structures and systemic risks of ETFs* (Monetary and Economic Department, Bank for International Settlements, Switzerland).

Hurlin, Christophe., Iseli, Gregoire, Pérignon, Christophe and Yeung, Stanley, (2016) *The Counterparty Risk Exposure of ETF Investors* (HEC Paris Research Paper No. FIN-2014-1050). Available at SSRN: <https://ssrn.com/abstract=2462747>, Hurlin, Christophe., Iseli, Gregoire, Pérignon, Christophe and Yeung, Stanley, (2014) *The Collateral Risk of ETFs*, (Geneva School of Economics and Management, Université de Genève). Available at <http://www.unige.ch/ses/dsec/repec/files/14081.pdf>.

⁸⁹ Morningstar ETF Research, (2012) *Synthetic ETFs Under the Microscope: A Global Study* Available at http://media.morningstar.com/eu/ETF/assets/SyntheticETFsUnderTheMicroscope_AGlobalStudy_Morningstar.pdf Additionally, where default occurs, the secondary market price of the ETF will incorporate credit spreads for the defaulting counterparty, thereby also affecting an investor’s return.

91. In the future, it can be expected that certain elements of Regulation 648/2012, on OTC Derivatives, Central Counterparties and Trade Repositories, (“EMIR”), will have an impact on the synthetic ETF structure described above. For example, in relation to swaps there is a mandatory daily exchange of variation margin for all new contracts entered into from the 1 March 2017 and, depending on the applicability of relevant thresholds, mandatory exchange of variation margin for all new contracts.⁹⁰

Counterparty exposure

92. UCITS are required to limit counterparty risk exposure⁹¹ and as such there is a robust regulatory infrastructure to manage and monitor risk already in place. The risk exposure of UCITS ETFs to a counterparty which is an eligible credit institution is limited to 10% of the net asset value of the ETF. Where the counterparty is not a credit institution the risk exposure is limited to 5% of the net asset value of the ETF. These quantitative limits do not mean that each ETF will have a number of counterparties. It is likely that a single counterparty could act in relation to an ETF.⁹² The UCITS framework does not restrict the extent to which a series of related parties can act for a UCITS. There is no concept in the UCITS Regulation that connectedness between counterparties changes or adds to the riskiness of those exposures.
93. The CBI Survey ascertained that it is likely that those financial institutions which act as swap counterparties will be the only APs for the ETF.⁹³ There are also examples of ETFs where the investment manager is the same entity or is part of the same group as the AP and the counterparty.⁹⁴ For this reason, ETF investors are exposed to the risk that a stress event affecting one of these parties could have a knock-on impact on the functioning of the

⁹⁰ Commission Delegated Regulation (EU) 2016/2251 of 4 October 2016 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories with regard to regulatory technical standards for risk-mitigation techniques for OTC derivative contracts not cleared by a central counterparty (<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:340:FULL&from=EN>). These regulatory technical standards will require an ETF to hold cash collateral for variation and initial margining purposes. They will also require collateral to be of a specific nature, quality and quantity. While variation margin must be posted in the context of all swaps, initial margin is only required where exposure to a counterparty exceeds a particular threshold.

⁹¹ Regulation 70(1)(c) of the European Communities (Undertakings for Collective Investment in Transferable Securities) Regulations 2011 (the “UCITS Regulations”) requires a UCITS to limit risk exposure to a counterparty in an OTC derivative transaction to 10% of the UCITS net asset value (where the counterparty is a specified type of credit institution. The risk exposure limit to a counterparty must otherwise be 5% of the UCITS net asset value.

⁹² The CBI Survey has shown, for example, that a circa €2.3 billion ETF has four counterparties, a circa €550 million ETF has one counterparty, a circa US\$540 million ETF has two counterparties, a circa €550 million ETF has one counterparty and a circa US\$280 million ETF has six counterparties. While the CBI Survey provides evidence based on a sample of Synthetic ETFs it does not have data relating to whether this level of concentration is typical (although there is an expectation that it is).

⁹³ The CBI Survey has shown, for example, a circa €550 million ETF has one counterparty which is also the AP, a circa €730 million ETF has one counterparty which is also the AP, a circa €2 billion ETF has 1 counterparty which is also the AP.

⁹⁴ Additionally, the management company (where there is one), the administrator and the custodian could be members of the same corporate grouping.

entire ETF. This risk has been reflected in observations by the EBA, that ETFs might be “prone to runs in the event of entity-specific rumours or especially adverse market developments.”⁹⁵ Academic research arrives at a similar conclusion. Hurlin, Iseli, Pérignon and Yeung⁹⁶ recognised the sensitivity of ETFs (both physical⁹⁷ and synthetic) to counterparty risk. They highlight that institutional investors monitor counterparty credit risk when investing in synthetic ETFs and will exit from holdings should any concerns arise. As noted by the Bank of Canada

“This risk to investors is heightened if there is a concentration of counterparty risk (i.e., a single counterparty). In addition, risks to the financial system could be higher if multiple ETFs rely on the same counterparty.”⁹⁸

94. In practice, should an ETF's counterparty default, the ETF must quickly find a replacement counterparty. It may also be required to liquidate collateral. In the event that either or both of these are not possible, the ETF can no longer operate.⁹⁹ Yet, it appears that if there was only one AP acting in relation to the ETF and that AP was also a significant counterparty, the ETF would face very significant and particular challenges.
95. This apparent concentration risk also appears to generate a potential conflict of interest¹⁰⁰ for the ETF insofar as the dual or linked roles of the counterparty and the AP are concerned. Neither entity has a fiduciary duty to the ETF (as their interests are purely commercial ones) and so the ETF is exposed to the risk that these interests, particularly in a stressed environment, will outweigh the commercial obligation (as swap provider) and commercial relationship as the (de facto) sole conduit for investor access to the ETF.
96. On the other hand, there can be efficiencies in having a limited number of counterparties. It may be operationally more efficient to monitor and manage an arrangement with one counterparty rather than a number of counterparties. For example, when an ETF provider

European Banking Authority, (2013) *Opinion of the EBA on Good Practices for ETF Risk Management*. Available at https://www.eba.europa.eu/documents/10180/604566/EBA-BS-2013-010--Opinion-of-the-EBA-on-Good-Practices-for-ETF-Risk-Management_1.pdf

⁹⁶ Hurlin, Christophe., Iseli, Gregoire, Pérignon, Christophe and Yeung, Stanley, (2016). [This paper seeks to compare and contrast counterparty risk exposure of ETF investors through an \(i\) assessment of collateral quality, \(ii\) identification of ETF types which present most risk and \(iii\) analysis of investor reaction to changes in their assessment of counterparty risk exposure.](#)

⁹⁷ Physical ETFs which engage in securities lending will be exposed to counterparty risk in the context of securities on loan.

⁹⁸ Bank of Canada, (2014) *Exchange-Traded Funds: evolution of Benefits, Vulnerabilities and Risks*, Financial System Review. Available at <http://www.bankofcanada.ca/wp-content/uploads/2014/12/fsr-december14-foucher.pdf>.

⁹⁹ This risk remains under EMIR. Mandatory collection of initial margin will protect the synthetic ETF from the negative effects of the default of the swap counterparty, but only for a limited number of days, and under extreme but plausible market conditions. It does not remove all risk of loss from counterparty default.

¹⁰⁰ Also noted by the Financial Stability Board, (2011) *Potential financial stability issues arising from recent trends in Exchange-Traded Funds (ETFs)*. Available at http://www.fsb.org/wp-content/uploads/r_110412b.pdf.

is structuring the ETF, it will be cognisant of market events which could cause operational difficulty to an AP (i.e. difficulties the AP may face in hedging its ETF-related exposures). This is because commercially, if the ETF has “structuring” complexities it will not be an attractive investment proposition for an AP. An ETF provider will, therefore, take account of possible market events in the ETF structure and documentation. The ETF provider could take account of expected difficulties by declaring certain days as not being ETF dealing days (for example if, on a particular day an underlying market is closed, an AP will be unable to purchase those securities and so will not be able to hedge its own exposure) or by identifying events (which could cause difficulty to an AP) as being those which trigger a suspension in the ETF.

97. Additionally, it is worth noting that if one were to require ETFs to increase the number of swap counterparties, this might result in placing the ETF below the minimum thresholds of the EMIR framework. The minimum threshold is €50 million of uncollected initial margins.¹⁰¹ Below this threshold, there is no obligation for counterparties to exchange initial margin (and above this threshold the margin due is reduced by the €50 million amount). This means that no initial margin is due to be collected. The purpose of initial margin is to protect counterparties against potential losses which could stem from movements in the market value of the derivatives positions occurring between the last exchange of variation margin before default of a counterparty and the time the OTC derivative contracts are replaced or the corresponding risk is hedged.¹⁰² (The importance of collateral, of which initial margin is a part, is considered further in the next section.) It could be argued that requiring ETFs to have a greater number of counterparties would need to be combined with a change in the law governing the obligation to exchange initial margin, to avoid any such requirement resulting in the ETF being less protected than in the case of a single swap counterparty.

Collateral Risk

98. Counterparty risk is defined in the UCITS Directive as *“the risk of loss for a UCITS resulting from the fact that a counterparty to a transaction may default on its obligations prior to the final settlement of the transaction’s cash flow.”*¹⁰³ Collateral risk is the risk that the value of assets posted as collateral will be insufficient to cover that counterparty risk. These two risks are related. In practical terms, the risk borne by the ETF and, in turn its investors, is

¹⁰¹ Article 29 of Commission Delegated Regulation (EU) 2016/2251 of 4 October 2016 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories with regard to regulatory technical standards for risk-mitigation techniques for OTC derivative contracts not cleared by a central counterparty (“RTS on risk mitigation techniques”).

¹⁰² Recital 3 of the RTS on risk mitigation techniques.

¹⁰³ Commission Directive 2010/43/EU as regards organisational requirements, conflicts of interest, conduct of business, risk management and content of the agreement between a depositary and a management company.

that the value of collateral available to the ETF is insufficient in the event of a counterparty failure. Additionally, in the case of an ETF using an unfunded swap, the risk is that the basket of securities purchased by the ETF is unable to deliver the same return as the index used by the ETF.¹⁰⁴

99. Where counterparty risk is elevated, the importance of loss of value of collateral is greater. Where an ETF receives collateral, either as a result of derivative usage or from use of SFTs, it is, in addition to the counterparty risk, exposed to risks associated with collateral.
100. The rules-based investment methodology of an ETF represents an ideal opportunity for securities lending. This is because, in the case of a physical ETF, the portfolio holdings will be dictated by an underlying index and (as they will not generally be sold) they are available to lend. In a synthetic ETF, the securities purchased by the ETF as part of the swap structure will also be available to lend.¹⁰⁵
101. In the case of synthetic ETFs, collateral related risks arise as a result of counterparty exposure management, and in the case of both physical and synthetic ETFs, from SFTs. While, in principle, any investment fund which uses derivatives is exposed to these risks if it adopts a total return swap strategy as outlined above, these risks are characteristic of synthetic ETFs. With regard to the swap models referred to above, securities bought and / or received are described here as “collateral” (even though, as noted below at paragraph 105, such securities are not technically collateral) because ultimately, in the event of counterparty default the ETF will have recourse to, or will otherwise need to use, these securities.
102. The UCITS Directive and EMIR each regulate the usage and management of collateral related risk. In the case of OTC derivatives, EMIR specifies criteria with regard to type, quality, quantity and haircut levels to which collateral must be subjected. However there are no similar rules for SFTs. A UCITS is subject to the ESMA Guidelines and so, within these confines, is free bilaterally to negotiate collateral for SFT arrangements. The ESMA Guidelines specify certain qualitative criteria with which collateral must comply. They also require the UCITS to have a collateral management policy in place as well as requiring risks related to collateral to be identified, managed and mitigated by a risk management

¹⁰⁴ Hurlin, Christophe., Iseli, Gregoire, Pérignon, Christophe and Yeung, Stanley, (2016)

¹⁰⁵ Morningstar has noted that securities lending is not typical in synthetic ETFs “because the securities that usually make up substitute baskets and collateral don’t command high lending fees.” Morningstar ETF Research (2012).

process.¹⁰⁶

103. The ESMA Guidelines do not set quantitative criteria for collateral received. The ESMA Guidelines permit a UCITS to receive collateral¹⁰⁷ provided it is of high quality,¹⁰⁸ (i) liquid,¹⁰⁹ (ii) diversified,¹¹⁰ (iii) valued at least daily¹¹¹ and (iv) uncorrelated to the counterparty.¹¹² One of the most important criteria imposed by the ESMA Guidelines relates to enforceability – collateral must be capable of being “fully enforced” at any time by the UCITS without reference to, or approval from, the counterparty. Collateral received by a UCITS must either be held by the UCITS depository (where the collateral arrangement represents a transfer of title) or by a third party custodian which is unrelated to the provider of the collateral.
104. In addition to rules relating to collateral management, UCITS regulated by the Central Bank must have regard to, and comply with, the requirements of the CBI UCITS Regulations in relation to connected person transactions.¹¹³ The CBI UCITS Regulations require that a transaction which is carried out between a UCITS and its management company or depository, or the delegates, sub-delegates or associated group companies of such management company or depository must be conducted at arm’s length and in the best interests of shareholders of the UCITS. This will be relevant to the UCITS ETF if securities are purchased, or collateral is received, from a connected person.
105. In the case of funded swaps, the ETF is not the legal owner of the securities (rather it has the ability to call on them in the event of counterparty default). In the case of unfunded swaps, the basket of securities is not collateral as they are owned by the ETF.
106. The question is whether the CBI UCITS Regulations adequately regulate the collateral risk arising from synthetic ETFs having regard to the potential for connectedness of the counterparties and for variation in the quality of collateral.

¹⁰⁶ This risk management policy will also, where the UCITS receives collateral for at least 30% of its assets, generally contain stress testing procedures to enable the UCITS to assess collateral-related liquidity risk in both normal and exceptional liquidity conditions.

¹⁰⁷ Where cash collateral is received it can be reinvested by way of reverse repurchase transactions with credit institutions, or reinvested in high-quality government bonds or short-term money market funds. Where non-cash collateral is received it cannot be sold, reinvested or pledged.

¹⁰⁸ High quality is determined by reference to the issuer of the collateral.

¹⁰⁹ Other than in the case of cash collateral, collateral received must be “highly liquid” and traded on a regulated market. It must be capable of being sold quickly and at a price which is close to its pre-sale valuation.

¹¹⁰ Collateral received must be diversified by reference to country, markets and issuer. It must also be diversified from a quantitative perspective in that it must generally respect the diversification rules that are applicable to a UCITS’ portfolio.

¹¹¹ Collateral must have transparent pricing and must be valued at least daily basis. Where collateral received by the UCITS exhibits high price volatility then it must be subjected to “appropriate conservative haircuts.”

¹¹² Collateral should be issued by an entity that is independent from the counterparty and which is not expected to display a high correlation with the counterparty’s performance.

¹¹³ Regulation 41 of the CBI UCITS Regulations.

107. The two points considered in this section are closely connected because the ETF provider will seek to manage risk exposure to a counterparty through a collateral management programme. In the case of synthetic ETFs in the event of counterparty failure the ETF has recourse to (or must place reliance on) either collateral that has been posted by the counterparty (in the case of a funded swap) or to the basket of securities in the ETF's portfolio (in the case of an unfunded swap).
108. If the essence of risk exposure to the counterparty is collateral available to the ETF then the quality and quantity of it will be relevant. If the collateral to which the ETF has access is poor or illiquid or has fragile liquidity, then the ETF and its investors are at risk of suffering loss arising from counterparty default.
109. Academic research has observed that in practice collateral received by an ETF is directly from the counterparty's existing inventory. The transfer of existing inventory to an ETF can be of benefit to the counterparty (or its related group companies) as, by posting high risk-weighted securities as collateral, it can reduce the required regulatory capital.¹¹⁴ The risk is expressed by the FSB as being that

“the synthetic ETF creation process may be driven by the possibility for the bank to raise funding against an illiquid portfolio...[which]...could be less liquid equities or low or unrated corporate bonds in an unrelated market.”¹¹⁵

110. The FSB's concern was echoed by Ramaswamy¹¹⁶ where he noted that the nature of the unfunded swap transaction suggested that the structure could be used by the ETF's sponsoring institution as “a funding vehicle for its warehoused securities” with there being “incentives to post illiquid securities as collateral assets.” He further noted that the posting of collateral from inventory can result in the counterparty being able to fund its market making activities at zero cost.
111. It is unclear whether the analysis carried out by the FSB and by Ramaswamy is as significant in a UCITS context as it might be otherwise, particularly in the environment since the ESMA Guidelines were introduced in 2012. Limited data is referenced by each of these papers. The FSB's case study referenced one hypothetical ETF based on the S&P 500, while Ramaswamy cited the position in relation to one ETF which used a funded swap to

¹¹⁴ Hurlin, Christophe., Iseli, Gregoire, Pérignon, Christophe and Yeung, Stanley, (2016) [Securities such as corporate bonds and equities are high risk-weighted asset classes.](#)

¹¹⁵ Financial Stability Board, (2011).

¹¹⁶ Ramaswamy, Srichander (2011).

replicate a MSCI emerging markets index. Should this be considered significant?

112. The analysis carried out by Hurlin et al.¹¹⁷ tested the hypotheses noted above in an empirical analysis of a US\$40 billion collateral portfolio of 164 ETFs. The data gathered permitted interrogation of collateralisation levels, quality and liquidity of collateral and so gave a more rounded sense of likely market practice.
113. The outcome of their research was that the propositions set forth by the FSB and by Ramaswamy could not be supported based on current data. The data evidenced (in contrast to that cited by the FSB and by Ramaswamy) that ETFs were generally over-collateralised and had access to liquid, high quality collateral (mainly equities issued by large entities and highly-rated bonds).
114. As noted above, collateral received by the ETF must meet certain qualitative and quantitative criteria. Save for a UCITS rule preventing correlation between performance of counterparty and the collateral received from the counterparty¹¹⁸ (which will be relevant only in the context of funded swaps), ETFs are free to agree the actual collateral to be received (or delivered) by the counterparty, subject to compliance with ESMA Guidelines. This seems to lead to the conclusion that there is a risk that securities received by the ETF from the counterparty in the context of unfunded swaps may be correlated with the counterparty and that this matter will not have been comprehensively addressed from a concentration of risk perspective when structuring the ETF.
115. In a default scenario an ETF will need (in the context of funded swaps) to liquidate the collateral to either pay redemptions or to enter into replacement swap agreements in order to deliver market exposure. For unfunded swaps the ETF will have a basket of securities which will need to be liquidated for the same reasons.
116. Where the collateral held is correlated to the financial index being tracked, there is more likelihood that liquidation of these securities will equate to the performance that would have been delivered by the counterparty under the swap (or indeed, the fund assets could deliver desired exposure themselves). Hurlin et al. have noted that a persistent criticism¹¹⁹ of ETFs

¹¹⁷ Hurlin, Christophe., Iseli, Gregoire, Pérignon, Christophe and Yeung, Stanley, (2014).

¹¹⁸ ESMA Guidelines on ETFs and other UCITS Issues ESMA/2014/937. The restriction on collateral that demonstrates a strong correlation with the counterparty (or is issued by the counterparty) is sensible as collateral of this type would defeat the purpose for which it had been provided (as default by the counterparty would be likely to reduce the value of that collateral to zero).

¹¹⁹ Financial Stability Board, (2011). The FSB noted the potential for abuse (in that a bank could transfer illiquid securities as collateral) where there are no correlation rules for the underlying collateral portfolio. This risk was also alluded to by Ramaswamy where he noted (in the context of a single ETF) that the emerging market exposure delivered under the swap was backed by a portfolio of Japanese securities.

is

*“the fact that the collateral may not be positively correlated with the index tracked by the ETF. Indeed, when the correlation is negative, the hedge provided by the collateral is less efficient: if the index return is large and positive and the swap counterparty defaults, the value of the collateral shrinks and a collateral shortfall mechanically arises.”*¹²⁰

117. Hurlin et al.¹²¹ in their work on collateral received by ETFs suggest that this risk does not appear to have materialised and that their empirical research did not support the supposition of a disconnect between collateral and index exposure. Hurlin et al. also noted that industry best practice was moving towards an improvement in disclosure and transparency. In particular, they referred to research carried out by Morningstar in 2011¹²² which noted synthetic ETFs’ lack of transparency in relation to collateral models. This research was followed by a 2012 Morningstar report¹²³ which reported an improvement in transparency but also recommended that

“ETF providers...[lighten the burden of research for investors in relation to ETF structures and risks associated with those structures]...by being fully transparent about their practices and the various risks associated with them.”

118. Morningstar also noted a *“real need for common industry standards as it pertains to labelling synthetic ETFs, disclosing information about the funds’ asset/collateral baskets, counterparties, and embedded costs.”*
119. In conclusion, while current academic research does not appear to conclusively support the idea that there is an enhanced collateral risk in ETFs there are a number of aspects in the operation and / or structure ETFs which involve collateral management and which, perhaps, require additional understanding both at the present time and as collateralisation practices develop further. Of interest also would be the extent of disclosure of collateral / basket of securities holdings of ETFs. While institutional investors (in particular) would be in a position to qualitatively assess collateral risk (and thereby make investment decisions) it is questionable whether this information would be of value to retail investors who would, most likely, not be in a position to evaluate collateral risk.

¹²⁰ Hurlin, Christophe., Iseli, Gregoire, Pérignon, Christophe and Yeung, Stanley, (2014)

¹²¹ Hurlin, Christophe., Iseli, Gregoire, Pérignon, Christophe and Yeung, Stanley, (2014)

¹²² Morningstar ETF Research, (2011) *Synthetic ETFs Under the Microscope*.

¹²³ Morningstar ETF Research (2012)

Section II Questions

In addition to the questions posed above (and in addition to any observations Stakeholders may have generally), the Central Bank poses the following specific questions:

- G. Are conflicts of interest rules effective for dealing with concentrations of activities within an ETF provider's financial group (e.g. group entities could act as promoter, investment manager, AP and swap counterparty or SFT counterparty)? Are other approaches worthy of consideration?
- H. Could multiple counterparties expose ETFs to unintended risks and consequences?
- I. Some academic research suggests that if a synthetic ETF experiences counterparty default, the synthetic ETF is more likely to be able to deliver the performance of its underlying index if the collateral received is correlated to that index. Should collateral received (where a funded model is used) or securities purchased (where an unfunded model is used) be correlated to the index being tracked? Is this practical, particularly for example where the index tracked by an ETF is comprised of securities which may be relatively expensive to access? Is collateral quality sufficiently regulated and disclosed?

Section III: Particular types and features of ETFs

120. As ETFs grow in popularity, the CBI is seeing an increasing variety of index exposures. UCITS have broad discretion when selecting an index to track.¹²⁴ While indices can be structured to reflect available market indicators, they may also be based on niche markets. Indices can also be structured to deliver bespoke exposures; specifically, they can deliver leveraged returns or inverse returns. In this context, the Central Bank has identified certain areas of interest namely, the rebalancing trades by leveraged or inverse ETFs, transparency and pricing of active ETFs and front running in the context of active ETFs.

Rebalancing, Volatility and Leveraged or Inverse ETFs

121. A leveraged ETF seeks to deliver a return which is a multiple of its underlying index, generally so that a factor of leverage is applied (e.g.+2x). The leverage activity will often be in the same direction as the underlying index.
122. Leverage is typically achieved by the ETF entering into a total return swap or through the use of futures. The leverage can either be embedded in the ETF itself (i.e. the ETF can track an index and use derivatives to generate the additional leverage so that the ratio of ETF to index exposure is, for example 2:1). Alternatively, leverage can be embedded in the index tracked by the ETF (i.e. the index incorporates the leverage feature and the ETF generates a return, generally through a swap which is a 1:1 exposure).
123. It is important to note that leveraged ETFs are designed to track an index on a daily basis and not over a longer period. These ETFs, therefore, rebalance their portfolio at the end of a trading day in order to maintain their target level of leverage. This amounts to the ETF *“having to buy on days when the market is up and sell when the market is down”*¹²⁵ and so has implications for investors holding leveraged ETFs for periods of longer than a day. The longer-term returns of a leveraged index have been demonstrated to be markedly different to the returns of a leveraged ETF held for longer than a day.¹²⁶
124. ETFs can also deliver an inverse exposure. This means that they generate exposure in the

¹²⁴ An index must comply with the ESMA Guidelines and appropriate due diligence must therefore be conducted on it in order to determine suitability for the UCITS.

¹²⁵ Zhang, Quingquan, and Judge, Thomas, (2016) *Investment Analysis of Leveraged ETFs* (Booth School of Business, University of Chicago)..

¹²⁶ Cheng, Minder, and Madhavan, Ananth, (2009) *The Dynamics of Leveraged and Inverse Exchange-Traded Funds*, (Journal of Investment Management, vol. 7, no. 4 (Fourth Quarter):43–62).

opposite direction to a particular market. The core idea of an inverse ETF is that an investor who wishes to obtain short exposure to a particular market can achieve the same economic result by purchasing an inverse ETF. For example, if the market underlying an index increases in value by a multiple of 1.5%, the ETF will deliver exposure of -1.5%. Inverse ETFs can also be leveraged so that the inverse return will be a multiple of the opposite direction of the underlying market (i.e. -2x, -3x and more recently -4x¹²⁷).

125. Like leveraged ETFs, inverse ETFs are structured using derivatives, namely total return swaps, and, like leveraged ETFs, they are designed to track an index on a daily basis and not over a longer period, meaning that cumulated performance will not match the index over longer holding periods.

126. For example, consider a leveraged inverse ETF purchased for €100 which delivers three times inverse exposure to an underlying unleveraged index of 20,000.

- a. Day 1: the index increases in value by 1% to 20,200, the value of the ETF moves down by 3% to €97.
- b. Day 2: the index increases in value by 1% to 20,402, the value of the ETF moves down by 3% to €94.09.

Over the two cumulative days, the index increases in value by 2.01% while the ETF has decreased in value by 5.91%. On a cumulative basis this is less than the 3% inverse return over a longer observation period.

127. Cheng and Madhavan's research suggests that the daily re-leveraging (or re-balancing) required as a result of the leveraged ETF *"has profound microstructure effects, exacerbating the volatility of the underlying index and the securities comprising the index"*¹²⁸ thereby resulting in market instability.¹²⁹ They note that the re-leveraging requires a swap counterparty to hedge its own exposure and that this will be done as near as possible to market close. Therefore, it can be expected that market volatility will be

¹²⁷ On 2 May 2017 the US SEC approved for the first time a request for a four times leveraged ETF and a four times inverse leveraged ETF, both of which deliver exposure to the daily performance of the S&P 500 futures. These ETFs are registered as commodity pools rather than as investment companies. See <http://www.reuters.com/article/us-sec-etfs-idUSKBN17Z009?il=0>

¹²⁸ Cheng, Minder, and Madhavan, Ananth, (2009).

¹²⁹ The extent to which leveraged ETFs are a source of concern was debated by Ivanov, Ivan and Lenkey, Stephen, (2014) *Are Concerns About Leveraged ETFs Overblown?* (Federal Reserve Board) Available at: <http://www.federalreserve.gov/econresdata/feds/2014/files/2014106pap.pdf>. They showed that capital flows (specifically, investor demand for the ETF) in the absence of market friction reduced the need for leveraged ETFs to rebalance which in turn mitigated their amplification of market volatility particularly where the investor aimed to hold the ETF over the longer term. The need to create and redeem units in an ETF did, however, constitute a market friction.

amplified as the trading session draws to an end.¹³⁰

128. There are different views surrounding the impact of leveraged and inverse ETFs. The analysis conducted by Trainor¹³¹ in relation to the S&P 500 notes “*the trading associated with leveraged ETFs does not appear to have any substantial effect on the market.*” This contrasts with Yagi and Mizuta’s¹³² study on the impact of leveraged ETFs on a simulated market which suggests that “*the greater value of assets managed by the leveraged ETF corresponds to a greater volume of rebalancing trading in the underlying asset and a higher volatility in the market.*” Their finding is consistent with Trainor’s comment relating to the size of the S&P 500 market and his suggestion that, should a leveraged ETF make up a larger segment of a market, it was possible it could have an effect on that market. As summarised by Cheng and Madhavan “[t]he magnitude of the potential impact is proportional to the amount of assets gathered...the leveraged multiple promised, and the underlying index’s daily returns.”¹³³
129. This observation is focused on the “micro-structures” of markets and thereby appears relevant to the MIFID II regulatory framework rather than the UCITS regulatory framework. Whether it constitutes a significant issue for the regulation of ETFs appears to depend on either the further growth of the sector or could be relevant in a smaller asset class if such rebalancing trades were to become a significant portion of the total trading volume?

Active ETFs

130. While ETFs are generally associated with rules-based investment strategies, as ETFs have become more popular the interest in establishing actively managed ETFs has increased. There are different views about what constitutes an “active” ETF. Some commentators

¹³⁰ Cheng, Minder, and Madhavan, Ananth, (2009) note that, irrespective of whether the leverage is achieved through swaps, futures, purchase of physicals on margin or other derivatives, the economic effect will be the same as the leveraged ETF is premised on the basis of a leveraged exposure.

¹³¹ Trainor, William, (2010) *Do Leveraged ETFs Increase Volatility* (Technology and Investment Volume 1, 2010).

¹³² Yagi, Isao and Mizuta, Takanobu, (2016) *Analysis of the Impact of Leveraged ETF Rebalancing Trades on the Underlying Asset Market Using Artificial Market Simulation* (Social Simulation Conference). Available at http://194.116.73.185/papers/SSC_2016_paper_7.pdf

¹³³ The concerns raised were exemplified by the Japanese market turbulence attributed to The Next Funds Nikkei 225 Leveraged Index ETF (“NFNL ETF”) which generates its leveraged feature through the use of futures. These futures need to be executed after stock market close and before close of the underlying futures market. There is a 15-minute window between the two closures. The suggestion is one of increased volatility during this window which results in market instability. One of the key relevant features of the NFNL ETF is its size. With more than ¥409 billion in assets under management (AUM as at 30 November 2016. Source: Bloomberg) it is the world’s largest leveraged ETF. This scale means that, in order to deliver the desired leveraged exposure, the ETF needs to have ¥818 billion in index futures. Concern surrounding the NFNL ETF is that the futures market may not be able to absorb the orders needed to generate requisite leverage. As a result, the investment manager, Nomura, has on a number of occasions since 2015, suspended redemptions in both the NFNL ETF and other leveraged ETFs – one delivering inverse exposure and the other double inverse exposure.

consider an ETF which tracks an index other than a market capitalised index as “active.”¹³⁴ Madhavan outlines two distinct categories of “active” ETFs: those which are active on a rules-based methodological approach (for example, those ETFs which use factor (or “smart beta”) indices¹³⁵); and those which seek to achieve “alpha”¹³⁶ (for example, those ETFs seek either to outperform a benchmark or to deliver a discretionary strategy-based return). UCITS ETFs which are actively managed are defined by reference to the latter category as the ESMA Guidelines provide that an actively-managed ETF is an ETF which “*generally tries to outperform an index.*”

131. Discussion in the following paragraphs relates to ETFs which are actively-managed UCITS ETFs (rather than to ETFs which track factor indices).
132. In theory, the only limitations on an active ETF’s investment exposure are the UCITS rules on eligible assets. This means that as a UCITS, an ETF can pursue an investment strategy which is the same as any other UCITS investment fund. The only feature distinguishing an active ETF from an actively managed UCITS might be, therefore, the exchange-traded nature of its shares and the related primary dealing restrictions discussed in Section I.
133. In practice, however, the ETF structure may not be appropriate for every type of product that is possible to establish as a UCITS. For example, it may be possible to establish a UCITS ETF which delivers returns synthetically and by reference to a complex investment strategy. The questions raised by such a product are (i) whether it fits with the concept of an ETF being simple and transparent and (ii) whether investors can have a full appreciation of actual exposure delivered and risks associated with purchasing it. In addition, from a market impact perspective, there is a difference in terms of visibility. For example, while it may be possible to assess the impact an ETF delivering an index return could have on the underlying market, it is less likely that it would be possible to assess the potential market impact where the ETF is delivering a return based on a complex strategy, including one which embeds leverage.
134. Active ETFs are sometimes perceived to have some advantages over corresponding non-ETF investment funds. There is some evidence to suggest that active ETFs charge less

¹³⁴ Madhavan, Ananth, (2016) at 147 where he queries “*what...we mean by active? There are different definitions, but as an operational construct, one can define any deviation from market-capitalization weighting as an active strategy.*” Vanguard is also of the view that “*Any strategy, in fact, that aims to differentiate itself from a market-cap-weighted benchmark (e.g., “alternative indexing,” “smart beta” or “factor strategies”) is, in our view, active management...*”. See Vanguard Research, August 2016 *The case for low-cost index-fund investing* available at <https://personal.vanguard.com/pdf/ISGIDX.pdf>

¹³⁵ Factor (or “smart beta”) indices are rules-based indices which are designed to represent a return of “factors” such as momentum, yield, liquidity, size, value and volatility.

¹³⁶ “Alpha” is the measure of investment return that cannot be attributed to market volatility.

direct management fees than corresponding investment funds.¹³⁷ They are also available for intra-day trading whereas corresponding investment funds are not. Having an ETF structure may give an investment fund the opportunity to attract more investor capital. If this analysis were correct it would seem to be a certain rationale for at least some actively managed investment funds to put an ETF structure in place. The Central Bank has not seen a large number of applications for active ETFs but there seems to be some reason to anticipate a further increase in the rate of such applications.

135. Issues relating to portfolio transparency might be a reason why there is less demand for active ETFs. In order to consider matters relating to active ETFs it is necessary to look at issues relating to transparency of ETFs and “front running.”¹³⁸

Transparency and pricing of active ETFs

136. It seems that active ETFs may face particular transparency issues. The first of these relates to an ability to provide sufficient information to market participants to enable them to trade in ETF shares at a price which does not significantly vary from the ETF’s net asset value. The second relates to the extent to which an investor can be aware of the exposure obtained when holding the active ETF.
137. The Central Bank’s understanding of transparency in the context of ETFs generally is noted above, at paragraph 53. This is suggestive of the possibility for alternative approaches to full portfolio transparency, a matter of particular relevance to active ETFs. One particular study on the necessity for transparency compared pricing efficiency and liquidity of active ETFs and index ETFs. In his study, Thirumalai¹³⁹ analysed active ETFs which were traded on the Deutsche Börse, noting that the Deutsche Börse required active ETFs to make periodic public disclosure of top ten portfolio holdings.¹⁴⁰ Additionally, active ETFs were required to fully disclose their portfolio on a daily (and intra-day, on the occasion of a change in the portfolio) basis both to the exchange itself (for iNAV calculation purposes) and to a sole OLP. In this case, the OLP was obliged to “maintain parity” between the exchange traded price of the ETF and the net asset value of the ETF, the parity being

¹³⁷ Bojinov, Stoyan, (2015) *Actively Managed ETFs vs Mutual Funds: Critical Differences*, (<http://etfdb.com/active-etf-center/actively-managed-etfs-vs-mutual-funds/>) . This discussion notes that while active ETFs are more expensive than index ETFs, active ETFs are “generally speaking, far cheaper than comparable mutual funds.”

¹³⁸ Legally, “front running,” or “pre-positioning” is market abuse and is prohibited by the Market Abuse Regulation (Regulation no. 596/2014 on market abuse) as use of inside information. From a US perspective it is prohibited by the US Financial Industry Regulatory Authority’s Rule 5270. This Rule prohibits a broker from trading because of and ahead of a client order. The term “front running” is not used here in its legal sense.

¹³⁹ Thirumalai, Ramabhadran. (2003), *Active vs. Passive ETFs*, (Kelley School of Business, Indiana University, United States). Available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.474.7843&rep=rep1&type=pdf>

¹⁴⁰ Note that the current requirement of the Deutsche Börse is currently for all ETFs to publicly disclose top twenty holdings on a daily basis.

visible by reference to the iNAV. The OLP was, however, prohibited (under the rules of the Deutsche Börse) from carrying out arbitrage activity and was prohibited from disclosing portfolio information to any third parties. Thirumalai also reported that the Deutsche Börse required the active ETF (in addition to the iNAV) to select and disclose a benchmark index against which performance could be compared.

138. One of the results of Thirumalai's research was that the single informed OLP was "*better able to maintain liquid markets than multiple formed [ones].*" This was on the basis of analysis which demonstrated that, on average, active ETFs trade at insignificant deviations from their net asset value whereas passive ETFs trade at "*statistically significant but economically insignificant premiums*" from their net asset values. His research suggests that lack of public portfolio transparency does not *per se* result in pricing difficulties and wider spreads for investors, and that the "parity" in pricing was achievable.¹⁴¹
139. There is a second approach which is the use of a target index or a creation or redemption basket¹⁴² as a portfolio proxy. The process for this was outlined in a 2014 Vanguard presentation to the SEC.¹⁴³ The presentation, noting that full portfolio disclosure would result in significant exposure to front running, provided statistical evidence to show that where the index or creation/redemption basket is constructed in a manner which closely tracks the ETF's portfolio, that effective arbitrage and hedging was possible.¹⁴⁴ The success or otherwise of maintaining prices which are close to net asset value in an active, non-transparent ETF will only become apparent upon publication of the next net asset value.
140. There appears to be a greater tension in providing the transparency (upon which ETFs appear to rely) for active strategies. Perhaps the focus should be on the ability to achieve a structure which enables an active ETF to be efficiently priced and to have a liquid market?¹⁴⁵

¹⁴¹ Thirumalai also noted that the ability of investors to simply sell out of the ETF (with the OLP then redeeming at the ETF's net asset value) explained why active ETFs did not trade at significant discounts. Essentially, the commercial viability of the ETF is at risk where pricing is not tight.

¹⁴² See further Schedule A, paragraph 27 et seq. in relation to creation and redemption baskets.

¹⁴³ Vanguard. Meeting with the US Securities and Exchange Commission on 29 January 2014 to discuss portfolio transparency and basket composition requirements in potential Commission rulemakings regarding exchange-traded funds. <https://www.sec.gov/comments/s7-07-08/s70708-27.pdf>.

¹⁴⁴ Vanguard noted that, by calculating iNAVs based on basket contents efficient pricing and arbitrage was possible and correspondingly hedging was possible by the hedging of long ETF exposure against basket contents.

¹⁴⁵ US Securities and Exchange Commission Concept Release No. IC-25258; File No. S7-20-01 on Actively Managed Exchange-Traded Funds. Available at <https://www.sec.gov/rules/concept/ic-25258.htm> This suggests that an ability to have efficient pricing and a liquid market are essential features for an active ETF.

Front running and active ETFs

141. A second aspect to the transparency issues facing active ETFs is front running. Front running, as the term is used here, is the process of anticipating changes to a portfolio and trading in those changes with the aim of profiting from a subsequent increase in prices. Also described as “index arbitrage,” it

“is a strategy that seeks to profit at the expense of index investors. Wherever large sums of money follow a prescribed set of investment rules we think it likely that other market participants will be motivated to profit by “trading ahead.””¹⁴⁶

142. The practice, which is generally considered legitimate, is evident in the pattern of trading of index ETF constituents on the occurrence of index re-constitutions or rebalances. The trading opportunity arises because an index will announce changes to its constituents in advance of these changes being made. This can result in

“managers of [index] funds...attempting to buy or sell 10% of an entire company within the space of one or two days...[as]...their intention is publicly known often a week in advance... [t]his opens up the possibility of other market participants profiting at their expense.”¹⁴⁷

143. Because other market participants respond to the announcement of the index re-constitution or rebalance, security prices move between the date of the announcement and the date on which the ETF trades to match its portfolio to the index. If the ETF only trades in securities affected by the change once the change has occurred, it would most likely have to trade in those securities at a premium (where the securities are being added to the index), or at a discount (where the securities are being deleted from an index).
144. This activity will not necessarily result in tracking error because the ETF intends to track the index irrespective of direction. Therefore, any price reversion in the days following an index rebalance (and thereby cost to an investor of buying at inflated or discounted

¹⁴⁶ Winton Capital Management Research Brief, (January 2014 (revised July 2014)) *Hidden Costs in Index Tracking* Available at <https://www.wintonfunds.com/pdfs/papers/WWP%20HiddenCosts%2015012015.pdf>

¹⁴⁷ Winton Capital Management Research Brief, (January 2014 (revised July 2014)).

prices)¹⁴⁸ will not result in negative performance as it will “follow” the index.¹⁴⁹

145. By way of example, in March 2015, four days in advance of an S&P 500 Index reconstitution, it was announced that American Airlines Group Inc., (“AAG”) would be added to the S&P 500 Index. Between the time of announcement and the time AAG was added to the index its price had increased by 11%.¹⁵⁰ Given the time lag between the announcement and addition to the index, an opportunity to front run was available to any category of market investors (from retail investors to high frequency traders).
146. While front running of this kind may result in a cost to an investor this is widely considered legitimate market behaviour. The market behaves as it does in relation to anticipated merger announcements or significant financial result announcements by anticipating the event. Information comes to the market and the market responds to that information. The Central Bank does not at this time see front running as a significant public policy discussion point in relation the majority of ETFs.
147. Front running does, however, create particular concerns for those who manage active ETFs (given the proprietary nature of their strategies). Concern about this practice has also been expressed by at least one manager of index ETFs.¹⁵¹
148. As with the previous issue of maintaining sufficient disclosure to minimise variation in market prices from the value of the ETF’s underlying securities, active ETFs face particular concerns in providing the kind of disclosure other ETFs achieve because of the particularly high cost of front running (which can in turn lead to difficulties in achieving outperformance expected from an active ETF). Specifically, the concern is that disclosure by an active ETF of its portfolio could result in identification of proprietary strategies pursued by the ETF

¹⁴⁸ This is because the remainder of the market would have notice of the change and would be able to trade in the securities in advance of the effective date of the index change (thereby subjecting the securities to either downward or upward price pressure). Additionally, existing portfolio holdings may need to be rebalanced in the event the addition and / or deletion did not exactly match then current portfolio weightings (with market participants also being able to benefit by front running these trades also).

¹⁴⁹ For example, if a security is purchased by an ETF at an increased value (by comparison to a pre-index inclusion price) this may arise solely because of demand for the security in anticipation of it being included in an index (rather than being reflective of the fundamental value of the security). The index in which the security is contained will reflect the then-current market value of the security. Where the value of the security then falls in line with fundamental value post index inclusion then both the ETF and the index will reflect that value. Both will move in line with each other and so there will be no tracking error. However, what will not be apparent is the fact the ETF purchased at an inflated price (by comparison to pre-index inclusion value).

¹⁵⁰ See Levine Matt, (2015) *Can you Really Game Index Funds?*. Available at <https://www.bloomberg.com/view/articles/2015-07-07/can-you-really-game-index-funds->. This discussion also notes that “front running” does not necessarily have a wholesale negative effect on the market or on index funds. For example, if there was no pre-announcement of index changes securities could still experience price volatility as market participants seek relevant index securities in a short period of time.

¹⁵¹ Vanguard (2014) Meeting with the US Securities and Exchange Commission on 29 January 2014 to discuss portfolio transparency and basket composition requirements in potential Commission rulemakings regarding exchange-traded funds. <https://www.sec.gov/comments/s7-07-08/s70708-27.pdf> . Here Vanguard argued that “[d]aily holdings disclosure affirmatively and demonstrably hurts mutual fund and ETF performance by facilitating front running by professional traders (hedge funds, proprietary trading desks).”

thereby enabling the strategy to be anticipated and replicated.

149. There is an argument that if transparency is designed to inform investors of the actual exposure delivered by an ETF (for example, in the case of an index ETF which is marketed as delivering exposure to European securities) it might be the case that requiring portfolio disclosure is of most relevance to an index ETF. By comparison, an active ETF which seeks to deliver an excess-index return or exposure to a particular strategy is not marketed on the basis of exposure to specific, identifiable securities. Perhaps transparency is not as fundamental to the ETF structure as regulators and some market participants currently believe?
150. However, it seems clear that if it is the case that transparency is not necessary for ETFs but that portfolio holdings are disclosed in practice, then this information should be available to all investors on a non-discriminatory basis.

Section III Questions

In addition to the questions posed above (and in addition to any observations Stakeholders may have generally), the Central Bank poses the following specific questions:

- J. Are active strategies appropriate for “housing” in an ETF structure and if so, is there a limit to the type of strategy that would be appropriate? If the ETF structure provides opportunities for managers to achieve scale is there a downside to this where the strategy is active (or, if scale is achieved, its potential impact is not otherwise capable of being ascertained)?
- K. Similar to the question posed in Section I, is portfolio transparency fundamental to the nature of an ETF or are there are other mechanisms which achieve the same goal as transparency? In the context of an active ETF, is transparency essential in order to achieve a liquid market and to facilitate efficiency in pricing?

Section IV: ETFs and market liquidity

151. There is a strong and widely held view that ETFs are simple, transparent and liquid products. Consequently, as ETFs grow in popularity, their impact rises on the profile of market trading overall. Inevitably questions are asked about the consequential impact of ETF share trading on the orderliness and resilience of markets in publicly quoted securities. This section reviews aspects of the academic discussion of this linkage and considers whether there are any areas which should be a focus of further regulatory discussion.
152. ETFs are designed to be and are marketed as liquid structures which will provide efficient and cheap access to underlying assets. The liquidity of ETFs, in some cases, is significantly greater than the liquidity of those underlying assets because of the AP and OLP primary dealing arrangements previously noted. Liquidity in ETFs is impacted by two influences: primary dealing arrangements and liquidity of the underlying assets. Just as Section I focused on the particular primary dealing arrangements of ETFs, this section focuses on the particular relationship of ETFs to the markets for the securities included in the ETF investment strategy. The liquidity of underlying asset markets is subject to a range of influences unrelated to ETFs. However, as ETFs continue to grow in significance, it seems that an impact of ETFs on the liquidity of the underlying assets in which they invest¹⁵² might become more important. In turn this might indirectly impact on the ETF's own liquidity. This looks like a potentially complex feedback loop.

Assessing the Liquidity Impact of ETFs as rules-based investment vehicles

153. To assess the impact of ETFs on the liquidity of underlying markets, it is appropriate to focus on the typical rules-based, index-tracking investment strategy of ETFs. The analysis will, in part, also apply to all index-focused investment funds. However, while ETFs share with other investment funds the feature of allowing exposure to an underlying asset without directly investing in that asset, the particular characteristic of ETFs is that they allow that exposure in a highly liquid and quickly tradeable form.
154. There seem to be a number of relevant factors to consider: inclusion of a security in an index, the fragility of liquidity, informational efficiency in the underlying asset market, certain kinds of volatility in the underlying asset trading and the potential for ETF providers to step in to support secondary market liquidity. Among the questions on which we would like to

¹⁵² Hamm, Sophia (2014) *The Effect of ETFs on Stock Liquidity* Available at SSRN: <https://ssrn.com/abstract=1687914>. This paper suggests that investors who are concerned that they have less information about the value of underlying securities than other investors will choose, if possible, to invest in an ETF. These investors will migrate from the underlying securities to do so, thereby lowering their risk exposure (which arises due to their lack of knowledge). Whether this has a net effect of reducing liquidity in the underlying securities will depend on how much the ETF increases the total investment in those securities.

hear views is the question of whether these are the correct liquidity impacts to focus on.

155. Assessing the liquidity impact of ETFs is difficult both because of the increasing variety of investment exposures but also because liquidity is a complex concept:

“Market liquidity” is a slippery and elusive concept, in part because it encompasses a number of transactional properties of markets. These include “tightness” (the cost of turning around a position over a short period of time), “depth” (the size of an order flow innovation required to change prices a given amount), and “resiliency” (the speed with which prices recover from a random, uninformative shock).¹⁵³

156. A liquid market might be considered to be one which *“is almost infinitely tight...not infinitely deep, and which is resilient enough so that prices eventually tend to their underlying value.”*¹⁵⁴ The matter for consideration, therefore, is whether and how the presence of an ETF affects the tightness, depth and resilience in a market or class of assets due to the need for both the ETF and the AP to purchase or sell assets in that market or class.
157. The matter is further complicated because researchers have developed methodologies for assessing equity market liquidity based on a variety of different data sets (such as transaction data or other liquidity proxies). It is unclear, however, whether the methodologies are as valid in a bond market context. These methodologies can also result in a large portion of market data being excluded from academic research (as analysis has focused on bond trading which occurs above a particular threshold in order to measure liquidity in that market).¹⁵⁵ Similarly, there is insufficient data by reference to which a “normal” period can be used as a benchmark¹⁵⁶ in order to test the various hypotheses. It

¹⁵³ Kyle, Albert, (1985) *Continuous Auctions and Insider Trading* (Econometrica, Vol 53, No 6 1315 – 1335).

¹⁵⁴ *ibid*, Kyle’s generalised summary of Black’s definition of liquidity. For a comprehensive review of the complexities and challenges of assessing liquidity see Market Liquidity: Theory, Evidence and Policy, Thierry Foucault, Marco Pargano, Ailsa Röell, Oxford University Press, 2016.

¹⁵⁵ Sultan, Syed, *A Study on Bond Exchange-Traded Funds (ETFs) and Corporate Bond Liquidity*, (Dept. of Economics, University of Washington Seattle). Available at http://www.lyxor.com/fileadmin/user_upload/pdf/3-ETFs_AND_CORPORATE_BOND_LIQUIDITY-WP.pdf. Schestag, Raphael., Schuster, Philipp., and Uhrig-Homburg Marliese., (2106) *Measuring Liquidity in Bond Markets* (Review of Financial Studies) noted the absence of a common approach to measuring liquidity in bond markets. Interestingly they noted that in analyses of US bond market liquidity (which used transaction costs as a liquidity proxy) a large number of researchers omitted trade data below a certain threshold (usually US\$100,000). As approximately two thirds of trades in US corporate bonds are made below this threshold a significant amount of data is omitted. Uldand (2015) “The Market is getting nervous about something experts are struggling to define” <http://uk.businessinsider.com/liquidity-in-the-bond-market-2015-4?r=US&IR=T> also noted the absence of a definition in “The Market is getting nervous about something experts are struggling to define” <http://uk.businessinsider.com/liquidity-in-the-bond-market-2015-4?r=US&IR=T> where he noted “The problem with liquidity isn’t just that we have a hard time pinning down a definition, but also have a hard time measuring its presence or absence in the market.”

¹⁵⁶ Mizrach, Bruce, (2015) *Analysis of Corporate Bond Liquidity* (FINRA Office of the Chief Economist). Available at http://www.finra.org/sites/default/files/OCE_researchnote_liquidity_2015_12.pdf. Also noted by Uldand (2015) where he noted “The problem with liquidity isn’t just that we have a hard time pinning down a definition, but also have a hard time measuring its presence or absence in the market.”

is not practical to cover the full range of these considerations in this Discussion Paper, but respondents are invited to focus on the aspects of liquidity they consider most relevant.

Inclusion in an Index

158. The first matter to be considered is the impact of the liquidity of a security when it is included in an index. Ostensibly, the inclusion of a security in an index (i.e. it will have to be purchased by ETFs) should increase its liquidity because it increases the demand in that security. (If this were true there would be a correspondingly negative liquidity impact on the security when removed from an index.¹⁵⁷) However, it has also been observed that increased ETF ownership is associated with increased illiquidity of that stock (because there is a finite amount of available stock).¹⁵⁸ Both observations appear valid but it is also important to grasp that the inclusion/withdrawal of a security from an index will have both a temporary and a longer term impact. The relationship between inclusion in an index and liquidity is therefore complex and variable both over time and as between different asset classes.
159. Academic research indicates that when a security is first included in an index that this tends to increase liquidity¹⁵⁹ but, in time, tends to lower liquidity in the underlying market due to the increased number of shares which become unavailable due to the buy-and-hold activity of the ETF itself.¹⁶⁰ This can result in a reduction in liquidity because market traders find themselves “crowded out” from the underlying assets.¹⁶¹ As a consequence the ETF itself can end up holding more illiquid securities as it will “*deprive the underlying stocks [of liquidity] to a larger degree.*”¹⁶²
160. Intuitively, one would expect inclusion in an index by an ETF to have greater impact on a smaller (and therefore more illiquid) market arising from the increased purchase by ETFs of the securities comprising that market. However, Hamm’s research has suggested that there was a “pronounced” relationship between the extent of diversification within an ETF’s portfolio and the level of migration from the underlying asset market. This suggests that the

¹⁵⁷ Mazouz, Khelifa, and Saadouni, Bharim, (2007) *New evidence on the price and liquidity effects of the FTSE 100 index revisions*, International Review of Financial Analysis demonstrated the linkage between inclusion and removal of securities within an index and the pricing of those securities. The price of securities added to the index suggested non-information related factors were driving the change.

¹⁵⁸ Israeli, Doron, Lee, Charles and Sridharan, Suhas, (2016) *Is there a Dark Side to Exchange Traded Funds? An Information Perspective* Working paper. UCLA and Stanford University (draft 12 May 2016).
Hamm, Sophia (2014).

¹⁵⁹ Mazouz, Khelifa, and Saadouni, Bharim, (2007) at 96.

¹⁶⁰ Israeli, Doron, Lee, Charles and Sridharan, Suhas, (2016)

¹⁶¹ Ben-David, Izhac, Franzoni, Francesco, and Moussawi, Rabi., (2017) *Exchange Traded Funds* (submitted to the Annual Review of Financial Economics, 2017, Volume 9).

¹⁶² Hamm, Sophia (2014)

impact on liquidity in the underlying market is more complex than that intuitive view would suggest. Hamm's research indicates that diversification in an underlying market tracked by an ETF will result in illiquidity concerns, even if that market is diversified.¹⁶³

161. This conclusion, if supported more generally, would suggest that while the growth of passive investment, particularly through ETFs, may have an episodically negative impact on liquidity in the market for the underlying security, the net impact will depend on how much additional investment the ETF attracts to the security (which itself may vary over time). What it may also suggest is that an increased portion of overall liquidity in a security (taking the ETF market and the underlying asset class market as one), will become increasingly dependent on the effective functioning of the AP mechanism. It is not clear, however, that this phenomenon can be dealt with discretely by regulation.

ETFs may impact the informational efficiency of underlying securities

162. Informational efficiency is the degree to which, and speed with which, the market prices of securities correctly reflect available information for an underlying asset thereby showing its true value. Informational efficiency contributes to the efficient functioning of financial markets, the hypothesis behind which maintains that the inherent, or fundamental value of stock (which is known to market participants) is reflected in its price. Informational efficiency does not imply an absence of volatility, rather

*"[a]n informationally efficient market can have economically inefficient runs and crashes, so long as those crashes are not predictable ... An informationally efficient market is not supposed to be clairvoyant. Steady profits without risk would, in fact, be a clear rejection of efficiency...Informational efficiency means one and only one thing: prices reflect information."*¹⁶⁴

163. Academic literature reflects divergent views about the effects of ETFs on the informational efficiency of underlying securities. On the one hand, a number of studies present evidence that ETFs can, and do, enhance price discovery. On the other, there is evidence that ETFs have an adverse effect on the pricing of underlying securities.
164. From a general market perspective the price discovery effects of ETFs have been noted by Bhattacharya and O'Hara who observed that *"in turbulent conditions...ETF prices can*

¹⁶³ This was evidenced by Hamm in her analysis which attributed a portion of a stock's bid-ask spread to liquidity cost.

¹⁶⁴ Cochrane, John (2014), *Eugene F. Fama, efficient markets, and the Nobel Prize*. Available at <http://review.chicagobooth.edu/magazine/winter-2013/eugene-fama-efficient-markets-and-the-nobel-prize>

*serve as a source of information for market makers in underlying assets, and vice versa, setting the stage for important feedback effects between prices.*¹⁶⁵ Their analysis demonstrates that, at an aggregate basket level the ETF acts as a price discovery tool. However, at an individual security level the ETF can lead to “persistent distortions from the fundamentals.” The difficulty that arises, they suggest, when the market makers cannot distinguish between noise and fundamentals of the underlying asset.¹⁶⁶

165. The analysis conducted by Tucker and Laipply¹⁶⁷ on the effect of fixed income ETF trading on price discovery in underlying bond markets suggests that liquid fixed-income ETFs may act as a vehicle for price discovery. Furthermore, their analysis suggests that price discovery in the underlying market is reflected in the ETF and that was particularly so in volatile or dislocated markets.
166. The background to this conclusion is that, as Tucker and Laipply have observed, there are price discovery challenges which are known to exist in the bond market due to limitations on pricing transparency and due to infrequent trading. These features of bond markets are the result of there being far more bonds issued than equities and of the fact that bonds usually trade through less centrally organised markets than equities. Tucker and Laipply outlined that where bonds are infrequently traded the ability to price them is more challenging. The absence of a reliable current market traded price is exacerbated by the perception that market information is incomplete – leading to the likelihood of increased spreads to account for that risk. Furthermore, as the pricing methodologies of market vendors can result in prices that appear smoothed,¹⁶⁸ bond price behaviour in active or volatile markets can be inconsistent when compared to equity market prices. They found that, by comparison to more transparent and liquid equity markets, changes in bond valuations (and thereby index valuations) become visible over a longer time frame as it is only with an actual trade that a market value can be determined.
167. Tucker and Laipply considered the negative effects of the opaque and illiquid OTC bond market structure on market participants (investors) which both “*impede price discovery and create information-transfer frictions.*” They noted that

¹⁶⁵ Bhattacharya, Ayan, and O'Hara, Maureen, (2016) *Can ETFs Increase Market Fragility? Effect of Information Linkages in ETF Markets*. Available at SSRN: <https://ssrn.com/abstract=2740699>

¹⁶⁶ Bhattacharya, Ayan, and O'Hara, Maureen, (2016) explain this as follows: different traders have different types of information about different underlying assets with the total order flow representing the totality of available information. It is therefore not possible to distinguish information which is relevant to a specific asset solely from the ETF price.

¹⁶⁷ Tucker, Matthew and Laipply, Stephen (2013).

¹⁶⁸ Of interest also is Tucker and Laipply's commentary regarding the methodology of bond pricing. They point out that the methodologies employed by valuation service providers rely on a series of algorithmic or matrix approaches to estimate prices because actual values may not be available due to the thinly traded nature of the instrument. These prices, (which are relied upon by investment managers and index providers) are not necessarily reflective of the price at which a market participant can trade the bond.

“Investors who measure performance relative to a particular benchmark may not really know whether they are under-or outperforming the market, because the benchmark may not reflect information in a timely manner. Likewise, if only the most liquid securities reflect market information, investors get an incomplete picture of price evolution across a given market, which can lead to incompletely informed investment decisions.”¹⁶⁹

168. It is in this context that Tucker and Laipply viewed the benefit of fixed income ETFs as bringing *“the OTC market onto an exchange through the ETF structure [because it was possible to] more readily observe the impact of new information on fixed-income markets.”* To test their view Tucker and Laipply analysed the daily market price and index level¹⁷⁰ of a number of fixed income physical ETFs¹⁷¹ over a three year period. Their results demonstrated that

“the market price of an established fixed income ETF and its benchmark...are cointegrated, and that the ETF’s market price can often lead price movements in the underlying bond market, as represented by the...benchmark.”

169. The theme of information transmission via ETFs was further considered by Glosten, Nallareddy and Zou¹⁷² who documented that an increase in ETF trading resulted in an increase in the availability of quality information on underlying securities over the same trading quarter. This, they found, was particularly so both for smaller capitalised securities and for securities with “imperfectly competitive” equity markets. Glosten et al. found, through analysis of a large cross-section of ETF holdings data for effectively a ten-year period, that because APs trade underlying baskets of securities, firm-specific information is reflected more quickly in the price of underlying securities than in securities which are dependent on investor analysis of the value of a security. They found that, without an ETF involvement, information was less likely to be reflected in certain market segments (i.e.

¹⁶⁹ Tucker, Matthew and Laipply, Stephen, (2013) at 51-52.

¹⁷⁰ For which the net asset value of the ETF was used as a proxy because, in Tucker and Laipply’s view it *“reflected all fund distributions and expenses, allowing for a more direct comparison to the ETF market price.”*

¹⁷¹ These ETFs deal on an on an in-kind basis (where the AP needs to deliver underlying securities to the ETF in return for a creation unit), APs need to deliver the underlying bonds to the ETF. Where the AP has to purchase the bond in order to deliver it to the ETF (as opposed to having the bond already in its inventory), the AP will make a market trade in that bond, thereby feeding into the pricing information available for that bond. Conversely it was noted that where the ETF deals on a cash basis there was likely to be a more rapid adjustment to the market price / benchmark price divergence as APs would be able to act more speedily on a market dislocation by creating or redeeming.

¹⁷² Glosten, Lawrence, Nallareddy, Suresh, and Zou, Yuan, (2015) *ETF trading and informational efficiency of underlying securities* (Working paper. Columbia University).

those with low liquidity or those subject to short sale constraints) on a timely basis.¹⁷³

170. On the other hand, it can be argued that ETFs can have a negative effect on the quality of information available for securities in an underlying market, with a consequent impact on pricing of those securities. Israeli, Lee and Sridharan¹⁷⁴ were of the view that the negative effect of ETF ownership could be seen when observed over a longer period of time. To test this, they analysed a cross-section of US stocks over a fourteen-year period by examining the year on year effect of changes in ETF ownership on those securities' (a) trading costs and liquidity and (b) proxies for pricing efficiency. This was in contrast to the inter-quarter analysis conducted by Glosten et al.
171. The starting point of Israeli et al.'s paper is the distinct role of Kyle's¹⁷⁵ "informed" trader. They noted that the informed trader commits resources to gathering information on underlying securities and, in turn, converts this information into prices (with a consequential profit being made when trading with an "uninformed" trader). They contended that the supply both of available underlying securities and uninformed traders willing to trade in those securities was negatively impacted as a result of ETF ownership. This, in turn, impacted the security's informational efficiency. The study noted that

"As ETF ownership grows, an increasing proportion of the outstanding shares for the underlying security becomes "locked up" (held in trust) by the fund sponsor. Although these shares are available for trade as part of a basket transaction at the ETF-level, they are no longer available to traders who wish to transact on firm-specific information. Even more importantly, ETFs offer an attractive investment alternative for uninformed (or "noise") traders who would otherwise trade the underlying component securities. As ETF ownership increases, uninformed traders in the underlying securities tend to migrate toward the ETF market. Over time, both effects create a steady siphoning of firm-level liquidity which in turn generates a disincentive for informed traders to expend resources to obtain firm-specific information."

172. Israeli et al. argued that this has the consequence of a decline in the pricing efficiency of the underlying securities insofar as that "[o]ver time, [it] will result in a general deterioration in the firm's information environment, and a reduction in the extent to which its stock price is able to quickly reflect firm-specific information." The results of their study presented evidence that market incentives for information could affect pricing in underlying securities.

¹⁷³ Conversely, the same improvements on information transmission to larger firms and for firms in competitive markets was not evident. Glosten, Lawrence, Nallareddy, Suresh, and Zou, Yuan, (2015).

¹⁷⁴ Israeli, Doron, Lee, Charles and Sridharan, Suhas, (2016). "

¹⁷⁵ Kyle, Albert, (1985).

They also suggested that increased ownership by ETFs “can lead to increased trading costs for market participants, with further consequences for the amount of firm-specific information that is incorporated into stock prices.”¹⁷⁶

173. It is noteworthy, however, that Israeli et al. found that there was no inconsistency between their findings and those of Glosten et al.. Indeed, when Israeli et al. replicated the testing carried out by Glosten et al., it verified their finding that there was a “*positive contemporaneous correlation between increases in ETF ownership and the market's ability to incorporate same-quarter earnings.*” The apparent contradiction finds resolution in the time periods of observation; Glosten et al.’s measurements were taken in the same quarter whereas Israeli et al.’s were over the longer term. Israeli et al. concluded that “*while same-quarter ETF trading seems to improve pricing efficiency...over the longer run [the result] is that increases in ETF ownership lead to a deterioration in pricing efficiency for the underlying securities.*”
174. The proposal that ETFs negatively impact the efficiency of securities pricing is also discussed by Ben-David, Franzoni and Moussawi¹⁷⁷ who considered that increased ETF ownership resulted in increased “noise” in the price of underlying securities with a resultant destabilising effect. In turn, however, this is disputed by Madhavan and Sobczyk¹⁷⁸ who argued that the destabilising effect could be attributed to stale pricing and consequent price discovery.
175. Academic research would therefore appear to indicate that ETFs can have a negative impact on both the transmission of price-related information and the pricing of underlying securities, with increased volatility in underlying stock being evident with increased ETF ownership. Over the shorter term, however, research would appear to demonstrate that that ETFs can have a positive impact on transmission of price-related information (and thereby pricing) with the actual value of underlying securities ultimately being discernible from the market trading generated by ETFs. The question is whether this negative impact should be a cause for concern, if its existence is conceded, and, if so, whether there are proportionate measures which might ameliorate its effect. Or is this perhaps an issue to be taken into account in the risk management practices of asset managers invested in assets

¹⁷⁶ Israeli, Doron, Lee, Charles and Sridharan, Suhas, (2016) have noted that the same criticism could be levied at investment funds pursuing an index tracking strategy. However, they have suggested that the characteristics of ETFs such as their intra-day trade-ability, low trading costs and remoteness of risk (from the perspective of trading in the underlying individual components) make ETFs “*especially attractive to active noise (uninformed) traders who would otherwise trade the underlying securities.*” This is as compared to investment funds which, Israeli, Lee and Sridharan posit, are better suited to longer term buy-and-hold investors.

¹⁷⁷ Ben-David, Izhac, Franzoni, Francesco, and Moussawi, Rabih, (2015) *Do ETFs Increase Volatility?* Working Paper. (Ohio State University, University of Lugano and the Swiss Finance Institute, and University of Pennsylvania.).

¹⁷⁸ Madhavan, Ananth and Sobczyk Aleksander, (2016)

which also attract ETF attention and – by extension – to be taken into account by regulators in understanding the liquidity of markets? However, it may not be sufficiently clearly established that promoting informational efficiency is an appropriate regulatory objective at all. If that is so, the regulatory significance of any impairments to the informational efficiency of markets arising from ETFs would be debateable.

ETFs may encourage non-fundamental volatility of the underlying securities

176. Another potential regulatory concern, in addition to informational efficiency of markets, is the causes of volatility of traded securities. The “fundamental” value of a stock is that value which is ascribable to its intrinsic value. This intrinsic value can be assessed, for example, on the basis of financial statement analysis, cash flows, asset return, capital management and profit retention history. The assumption is that a stock will trade at a price which reflects its fundamental value. This is not, however, the case as “noise” can result in pricing variances which are at odds from the perceived fundamentals.

“Noise trading is trading on noise¹⁷⁹ as if it were information... The more noise trading there is, the more liquid the markets will be, in the sense of having frequent trades that allow us to observe prices. But noise trading actually puts noise into prices. The price of a stock reflects both the information that information traders trade on and the noise that noise traders trade on.”¹⁸⁰

177. While economic noise is “essential to the existence of liquid markets,”¹⁸¹ current academic research discusses the role ETFs play in the introduction of noise to the market underlying the ETF. The inexpensiveness¹⁸² and frequency with which ETFs trade, permitting traders to express their views on an intra-day basis, combined with the niche exposures which are achievable through the ETF structure, increases the potential impact noise traders can have on the underlying market.
178. In their 2015 paper Ben-David, Franzoni and Moussawi¹⁸³ found that increased ETF ownership resulted in increased stock volatility, or noise. They noted that the primary dealing mechanism (what they described as the “arbitrage mechanism”¹⁸⁴) of an ETF

¹⁷⁹ “Noise” is information with little informational validity.

¹⁸⁰ Black, Fischer, (1986) *Noise*, (Journal of Finance, Volume 41, Issue 3).

¹⁸¹ Black, Fischer (1986).

¹⁸² Inexpensiveness of trading the single ETF share relative to trading underlying securities individually.

¹⁸³ Ben-David, Izhac, Franzoni, Francesco, and Moussawi, Rabih, (2015). “Do ETFs Increase Volatility?” Working Paper. Ohio State University, University of Lugano and the Swiss Finance Institute, and University of Pennsylvania, March.

¹⁸⁴ The arbitrage mechanism operates where an ETF is either undervalued or overvalued by reference to its underlying portfolio. For example, where the ETF is overvalued by reference to its underlying portfolio, APs can purchase relevant securities and transfer them to the ETF in return for a creation unit. In this way they obtain ETF shares at a price which is

served as the channel through which this volatility was transmitted. They found that the frequency of primary dealing, resulting from the ease and speed with which investors could access the underlying market, resulted in the transfer of pricing pressure into the underlying market. Volatility was thereby increased in the underlying asset market.

179. In one example, Ben-David et al. considered the trading practices of hedge funds in ETFs and noted the compounding effect they could have on securities pricing. In the scenario proffered, the hedge fund bought an underlying security and then shorted the relevant sector ETF. This shorting put downward price pressure on the ETF and then, through the activities of cross-market arbitrageurs, the downward price pressure was transmitted to the securities in the ETF basket. This, they noted,

“suggests that ETFs can propagate mispricing to the underlying securities not only because they are traded directly by uninformed investors, but also because they are traded indirectly through their participation in long-short strategies that involve other mispriced securities.”

180. It was therefore argued that the advent of ETFs brings a “new layer” of noise which would not otherwise be present. Ben-David et al., caveated, however it was not possible to exclude that *“time-varying omitted factors could be driving [their] results”* but that the outcome of the analysis was consistent with their argument for the impact of ETFs.
181. In the alternative, Madhavan and Sobczyk¹⁸⁵ argue that volatility of the type referred to by Ben-David et al. could be attributed to stale pricing and price discovery carried out through the function of the ETF. They propose, as an alternative explanation to the propagation of shocks in the underlying markets through an ETF, that the ETF’s net asset value simply realigns over time to the actual value which has been discovered by the ETF. This is consistent with the findings of Petajisto, Israeli et al. and Glosten et al. It is neatly explained as reflecting the *“price impact [of]...shocks to fundamentals, ETFs lead price-discovery, NAV is “stale” and “catches up” over time.”*¹⁸⁶ Ultimately, there is a suggestion that analyses conducted (such as that by Ben-David et al. and by Madhavan and Sobczyk) can be interpreted in either way *“with no evidence of causality in either direction.”*¹⁸⁷

less than the price for which the underlying securities can be purchased in the market. Conversely, where the ETF is undervalued by reference to its underlying portfolio, the AP will submit a redemption request to the ETF in return for a creation unit. It will derive a profit from the difference between the (undervalued) ETF shares and the market price at which the securities are trading.

¹⁸⁵ Madhavan, Ananth and Sobczyk Aleksander, (2016).

¹⁸⁶ Madhavan, Ananth and Sobczyk Aleksander, (2016).

¹⁸⁷ Madhavan, Ananth and Sobczyk Aleksander, (2016) at 196.

182. It appears somewhat that the debate is, at least, inconclusive at this time. In the absence, furthermore, of a clear regulatory mandate with regard to reducing or optimising market ‘noise’, this does not appear to be an issue which requires further attention.

ETFs and the Creation of Fragile Liquidity

183. Liquidity in a properly functioning market can normally be seen as a function of the attractiveness of the asset to investors. However, it has long been recognised that the activity of the “sell side” can significantly impact on the liquidity of markets over the longer term (such that liquidity ceases to be simply a function of the number of beneficial buyers and sellers) and that this impact on liquidity can be present for sustained periods. This is what is meant in this Discussion Paper by “liquidity enhancement.” Intermediation carried out by market participants (such as APs) achieves this enhancement of liquidity when, through application of proprietary capital, they link buyers to sellers and they trade the asset on own account. Market participants are then rewarded by the spread on the asset price as well as by benefitting from changes in the price of the asset. However, APs who perform this market intermediation and can be seen as enhancing liquidity of ETFs. They may also enhance the overall market liquidity (when the combined markets of the underlying security and the ETF are considered).
184. Widespread opinion held by ETF providers appears to be that the liquidity of the ETF will be consistent with the liquidity of its underlyings.¹⁸⁸ This could be taken to mean that the ETF can offer to create and redeem its shares at least at the rate with which assets in the underlying market are dealt (i.e. if an ETF accepts creation and redemption orders on a particular day the AP must be able to trade in the underlying market on the same day in order to deliver relevant securities to the ETF or, to hedge its exposure).
185. However, ETFs can be traded on the secondary market multiples of times per day, enabling investors to achieve and exit exposure (through the ETF) at a speed which would not be possible to replicate by physically trading in the underlying market. ETFs can, therefore, provide what is sometimes termed the “liquidity illusion,”¹⁸⁹ through their secondary trading

¹⁸⁸ For example, see Vanguard, “Understanding ETF liquidity and trading” <https://www.vanguard.nl/documents/understanding-etf-liquidity.pdf> which states that “Although trading activity and market depth on the stock exchange contribute to an ETF’s secondary market liquidity, most of an ETF’s liquidity comes from its underlying securities.” J.P. Morgan “Debunking myths about ETF liquidity” https://am.jpmorgan.com/blob-gim/1383272223898/83456/1323416812894_Debunking-myths-about-ETF-liquidity.pdf “Thanks to arbitrage mechanisms that enable ETFs to continuously trade at or near intrinsic value, ETF liquidity is primarily determined by an ETF’s underlying securities. Therefore, small or thinly traded ETFs can, in fact, be highly liquid instruments.” BlackRock, <https://www.ishares.com/us/education/etfs-and-liquidity-enhancement> “Since the basket can be exchanged for shares at any point (and vice versa), an ETF will be at least as liquid as its underlying basket of securities.”

¹⁸⁹ The “liquidity illusion” was expressed by the Bank of International Settlements (2015) 2014/2015 85th Annual Report Available at http://www.bis.org/publ/arpdf/ar2015_ec.pdf as being market liquidity which “seems to be ample in normal

volume. Where there is a high trading volume there may be an assumption or impression that the assets underlying the ETF are equally highly liquid, irrespective of the level of transactions or availability of the asset in the underlying market. (Conversely, but less significantly, there could be an illusion, by virtue of a thin exchange-traded volume, that the underlying assets are illiquid.) The perception thereby created is that the frequency and scale of trading in the ETF is representative of or even constitutes the frequency and scale of trading capacity in the underlying exposure. It is possible to argue that this is not an “illusion” but rather an episodic or fragile form of liquidity. Even accepting that, the substantive point appears to remain; that the perception of liquidity of underlying securities is affected such that the actual level of sustainable liquidity harder to assess.

186. It is a common feature of regulatory frameworks around the globe to require asset managers to assess the liquidity of the exposures they take on, in order to plan prudently to be able to meet liabilities as they arise. However, the complexity in the way ETF liquidity is achieved and the potential fragility of that liquidity could, it might be argued, lead to a significant risk of misunderstanding of the liquidity of an exposure on the part of entities required to assess liquidity.
187. At one level this is a result of the fact that the risks examined in earlier sections are not susceptible to assessment by investors in ETFs but will tend to be longer term structural risks. Even if we confine the aspiration to investors being able to assess short term liquidity prospects, there seems to be significant challenges. Consider, for example, the case of a regulated entity seeking to assess the liquidity of an exposure to a non-transparent asset class to which it had exposure through an ETF. It might seek to rely on trader opinion, but it might also seek to rely on publically reported data on the extent of exchange-based trading in that ETF. There appear to be three different levels of difficulty for persons trying to assess liquidity, at least from a European perspective, using this method:
 - a. the liquidity of the secondary market as a whole is not known;
 - b. the frequency with which primary dealing occurs is not known; and
 - c. the liquidity of the trading in the underlying asset is not known.
188. Leaving aside for a moment, the significance of problems with accessing information on the trading in the underlying asset, the first significant point seems to be that, at least in a

times, but vanishes quickly during market stress. In particular, asset managers and institutional investors are less well placed to play an active market-making role at times of large order imbalances. They have little incentive to increase their liquidity buffers during good times to better reflect the liquidity risks of their bond holdings. And, precisely when order imbalances develop, asset managers may face redemptions by investors. This is especially true for bond funds investing in relatively illiquid corporate or EME bonds.”

European context, exchange-traded volume does not provide sufficient insight into the demand for an ETF. This is because the vast majority of ETF trading takes place OTC. ETF liquidity is the level of demand/supply on the exchanges on which it is listed, combined with OTC demand. As noted elsewhere, MIFID II changes should help with providing a more comprehensive trading volume/price data set.

189. At best, even if all this is known, it provides information on volumes and the apparent impact of volumes on price over time. It looks as if another key fact that needs to be understood is how robust pricing has been in the face of changes in supply. Where secondary trading as a whole (i.e. a combination of exchange and OTC trade demand) tends to push prices up, an AP will find it advantageous to approach the ETF directly to create additional shares. In that instance the primary market will be accessed and the liquidity of the underlying market will be tested (i.e. the creation of additional shares will test the strength of demand in the market). If the price remains steady in the face of increased supply, this is a strong indicator of the resilience of short term liquidity.

190. It does not seem practical for investors to make simplifying assumptions about the ratio of primary dealing to secondary trading in order to factor in this potential change in the supply of ETF shares into any assessment of liquidity. Respondents to the CBI Survey provided data both on the extent of secondary trading and the primary dealing (i.e. net creations and redemptions) over a three-month period for their top three ETFs. In the main, secondary trading exceeded primary dealing, but the pattern was highly variable. For example:
 - a. a circa €60 million ETF reported a secondary trading volume of shares as approximately 245,000 with no primary dealing; and
 - b. a circa US\$550 million ETF reported a secondary trading volume of more than 3.3 million with net creations of 60,000 shares.

191. In certain instances, however primary dealing exceeded secondary trading. For example :
 - a. a circa USD\$430 million ETF showed net creations of nearly 4.5 million shares whereas the secondary trading volume was only 90,000; and
 - b. a circa €475 million ETF showed a secondary trading volume of approximately 205,000 with net redemptions of 300,000 shares.

This confirms that demand for an ETF does not seem to be capable of being ascertained with strong reliability from a review of secondary trading volumes and prices in the absence of some understanding of impact of primary dealing. It would be interesting to understand what transparency in terms of primary dealing levels might indicate.

192. The concern regarding liquidity enhancement by ETFs may be more pronounced in a bond market context. This is because an ETF can deliver intra-day exposure to a portfolio of underlying bonds which are traded relatively infrequently:

*“because ETFs tend to trade in line with cash bond markets they could turn into a source of volatility if investors seek to exit their positions simultaneously, especially in corporate debt. Greater reluctance from banks to engage in market-making could result in fewer willing buyers when the tide goes out, exacerbating downward price moves.”*¹⁹⁰

193. In effect, the concern is that because ETFs have become such a strong investor in relatively illiquid bond markets, they have attracted investors who will leave the asset class if liquidity is not available. Market makers are less likely to intervene than they would have in the past. Therefore, those bonds have become more susceptible to sudden price falls.
194. Madhavan and Sobczyk¹⁹¹ also highlighted liquidity enhancement by bond ETFs when noting the trading frequency in corporate bonds as compared to the frequency of trading of an ETF. They looked at the (then) US\$16 billion bond ETF¹⁹² noting that despite the size and liquidity of the ETF itself (which had a spread of less than one basis point), *“less than third (28%) of bonds in the basket traded once or more a day during the months January and February 2014, based on FINRA TRACE data.”*
195. ETFs are a tool by which market participants can access an underlying market without actually dealing in the market itself. Providers argue that the ETF structure facilitates trading for those who have a need or desire for the exposure without the need to deal in the underlying market itself. BlackRock’s market commentary, Viewpoint, illustrates the argument.

*“Rather than trade hundreds of unique bonds, buyers and sellers of exposure to a bond market segment (such as high yield) can make a single trade in a bond ETF that represents that segment. By concentrating trading demand in a single instrument that trades continuously with centrally-reported quotations, bond ETFs help buyers and sellers of bonds find each other efficiently without having to rely on OTC dealers.”*¹⁹³

¹⁹⁰ Ranasinghe, Dhara, (2016) *Thriving ETFs may be stoking an illiquidity illusion for bonds* (Reuters) <http://www.reuters.com/article/us-markets-bonds-etfs-idUSKCN0VA2HY>

¹⁹¹ Madhavan, A., Sobczyk A., Price Dynamics and Liquidity of Exchange-Traded Funds, *Journal of Investment Management* 14.2 (2016): 86-102.

¹⁹² Note these statistics are from the first quarter of 2014 however, they serve to illustrate the point made here.

¹⁹³ BlackRock Viewpoint (2015) *Bond ETFs: Benefits, Challenges, Opportunities*.

196. This analysis seems largely accurate. But it could suggest that investors who would otherwise be disinclined to invest in relatively illiquid assets would be attracted to the ETF. Those investors might be more likely to divest from ETFs if they cease to provide a liquid market.
197. In his research, Sultan¹⁹⁴ found that increased ownership by both ETFs and investment funds lead to an improvement in the liquidity of high yield corporate bonds. He also found *“that bonds held by bond ETFs are more liquid than those which are not held by any ETFs.”*
198. Overall, the impact of ETFs on liquidity seems to be substantial and strongly positive for liquidity in all market situations where the AP mechanism works effectively. It seems intuitively reasonable to say that ETFs cannot be more liquid than their underlying assets for a sustained period. At the very least, the evidence that ETFs create only an “illusion” of liquidity seems not very strong, although the consideration of the evidence is complicated, as set out above, by the inherent difficulty in assessing liquidity issues. However, should the AP mechanism fail, market liquidity could, it seems, contract and could do so quite suddenly, depending on the profile of ETF secondary market investors. We have already noted the potential for correlated stress in collateral counterparties and APs. If those parties had separate exposures to markets whose liquidity had been enhanced by the activity of ETFs, impactful and complex patterns of contagion could emerge from these linkages. It is also noted that investors in ETFs may not have sufficient information available to them to make effective assessments of either long term or even shorter term prospects for the liquidity of ETFs. This suggests an alignment of interests as between the desire to protect investors in ETFs against the impact of a failure of the AP mechanism and the concern to protect the liquidity of markets.

ETF provider support

199. This sub-section considers whether ETF promoters might seek to reinforce secondary market trading to prevent its breakdown.
200. In general, ETF providers are large financial institutions¹⁹⁵ with a reputation to protect. ETFs are generally established by large financial institutions (rather than by boutique

¹⁹⁴ Sultan, Syed (above at note 161).

¹⁹⁵ For example, as at the end of August 2016, globally, the largest provider of ETFs and exchange-traded products is BlackRock (iShares) with a 36.6% market share and more than US\$1.43 trillion in assets under management (“AUM”). This is followed by Vanguard with an 18.4% market share and more than US\$721 billion in AUM, State Street Global Advisors (SPDR ETFs) with a 15% market share and US\$578 billion in AUM, Invesco (PowerShares) with a 3.2% market share and US\$124 billion in AUM and Nomura with a 2.3% market share and US\$89 billion in AUM (Source: ETFGI data sourced from ETF/ETP sponsors, exchanges, regulatory filings, Thomson Reuters/Lipper, Bloomberg, publicly available sources, and data generated in-house). Each of these providers have funds domiciled in Ireland.

investment firms) because in order to operate properly, they require a significant amount of expertise and infrastructure of the type typically only seen in large financial institutions. For example, ETF providers will typically have a large capital markets desk with which an AP can liaise to facilitate dealing. They will also have an established market presence as reputation is essential to obtain index licencing¹⁹⁶ as well as to market and distribute ETF shares. All of the largest global ETF providers have ETFs domiciled in Ireland which are regulated by the Central Bank. Each provider has a substantial market presence and is active both in the ETF market and generally, in the investment fund and other investment markets. The question is, therefore, whether an ETF provider would be incentivised, primarily from a reputational risk perspective, to support the ETFs it operates.

201. The Basel Committee on Banking Supervision¹⁹⁷ considered a similar concept which it described as “step-in risk,” i.e.

“the risk that banks would provide financial support to certain shadow banking or other non-bank financial entities in times of market stress, beyond or in the absence of any contractual obligations to do so.”

202. The Basel Committee on Banking Supervision noted the particular experience of money market fund sponsors during the 2008 crisis such that they *“felt obliged to offer liquidity to their associated funds when fund holders redeemed their funds en masse and there was a concern that the fund’s net asset value (NAV) would fall below par, due to the fire sales of assets as a result of significant concurrent withdrawals”*.
203. From an ETF perspective, the question is whether there is a risk that ETF providers would support their ETFs, particularly those with a large market share and particularly at the early stages of market stress, when its true import was not yet clear. For these large ETF providers there may be more of a reputational incentive to support an ETF in order to preserve its secondary market liquidity. This could happen particularly where the promoter believes that the fundamentals of the ETF are sound but there is, for some reason, market concern relating either to the particular ETF, the underlying market to which the ETF has exposure, or some other market event.

¹⁹⁶ In order to use an index, an ETF provider will need to obtain a licence from the creator of the index.

¹⁹⁷ Basel Committee on Banking Supervision, (2015) *Identification and measurement of step-in risk* Available at <http://www.bis.org/bcbs/publ/d349.pdf>

204. It is not apparent that there has been much discussion on the extent to which ETF providers would support their ETFs. The CBI Survey asked ETF providers for views on this issue. In excess of 68%¹⁹⁸ of respondents did not envision any circumstance where an ETF management company, promoter or any linked entity would support an ETF. Those ETF providers who saw no reason to support and provide liquidity in the secondary market cited a number of key factors that would mitigate any such need:
- a. the diversified range of APs and market makers seeking to trade in the ETF. It was considered that the existence of a wide range of market participants would ensure efficient, orderly markets;
 - b. the ability to trade ETFs on a range of platforms include different stock exchanges, multi-lateral trading facilities or on an OTC basis;
 - c. remunerated OLPs who were contractually committed to provide liquidity to the ETF by providing exchange-based two-way pricing; and
 - d. prospectus disclosures which outlined risks (including those relating to liquidity and secondary market trading) and which outlined the ability to redeem ETF shares directly with the ETF.
205. These factors, while reasonable, are untested. Furthermore, should they fail to materialise, it is unclear if ETF providers would ever provide support.¹⁹⁹
206. A number of respondents to the CBI Survey did not exclude the possibility of support for ETFs from promoters or managers. These respondents were mostly linked to global banking institutions.²⁰⁰ Banking institutions can access liquidity from the market (and ultimately, from central banks) and so could in theory provide liquidity to an associated entity. Some ETF providers did contemplate providing support where it might be appropriate to arrange for liquidity support of the ETF in the secondary market.²⁰¹ A small subset of these respondents advised that liquidity support had been provided in the past and / or may be considered on a case-by-case basis in the future. No detail on the type of support was indicated in the responses.
207. All respondents held the view that there was no investor expectation that an ETF provider would support an ETF.

¹⁹⁸ 15 out of 22 respondents.

¹⁹⁹ Additionally, (and as noted earlier) the limited liquidity provided by OLPs and the possible inability of investors to redeem directly with an ETF are matters which continue to be discussed.

²⁰⁰ Seven respondents contemplated the possibility of providing support to various degrees. Five noted they would. The remaining two were asset managers and were not as definitive as other respondents in their rejection of the possibility of support.

²⁰¹ Respondents did not provide specifics in relation to how this support might be provided. Support was contemplated at primary and secondary market levels and in the context of trading or liquidity issues arising.

208. Particularly in circumstances where there is ambiguity in terms of the ability of a secondary market investor to access the primary dealing arrangements of an ETF (see the discussion at paragraphs 35-39 above), there may be an incentive for promoters to support, contrary to their current planning. The pressure could be strong to alleviate an ETF facing increasing shareholder pressure. One way in which this might be done, would be to arrange for a group entity to buy ETF shares in the secondary market, thereby alleviating the intensity of demand. From a broad regulatory perspective, it appears that if there is a risk this might be done, that risk needs to have appropriate capital assigned to it and appropriate liquidity planning associated with it. From an investor protection perspective, the lack of clarity around this matter may not be optimal. From the point of view of the resilience of markets, any lack of clarity around this point is likely to add to the causes of contagion. Respondents are invited to discuss how best to manage this risk.

Section IV Questions

In addition to the questions posed above (and in addition to any observations Stakeholders may have generally), the Central Bank poses the following specific questions:

- L. Some commentators are concerned that ETFs are tracking indices of underlying stocks which are not sufficiently liquid to match the intra-day liquidity on the secondary market which the ETF offers. This statement is quite simplistic and does not, for example, reflect that there may be much secondary market activity but very little primary market activity. UCITS, including UCITS ETFs, are subject to general liquidity management rules which should ensure that ETFs track indices of underlying stocks that are sufficiently liquid to allow the ETF to meet creation and redemption requests. Is this sufficient? What liquidity practices do ETFs follow? Are there other practices that might be appropriate for ETFs?
- M. One of the potential impacts from greater investment in index-tracking ETFs is decreased informational efficiency of underlying securities as well as increased non-fundamental volatility of underlying securities. However, these may not be risks *per se* or, at any rate, may not be risks that ETF providers or regulators can mitigate, manage or eliminate. Is this assessment correct or could measures be taken to address this impact?
- N. One of the key issues in the context of support by ETF providers is investor expectation. Investors' views about purchasing ETFs and their ability to sell may be

informed by whether or not the ETF provider will support the ETF in the face of stress events. There are, however, divergent views amongst ETF providers as to whether they would support their ETFs. Is provider support a desirable objective?

Section V: Other considerations

European-level analysis is not available – is the commentary in the Discussion Paper equally as valid in a European context?

209. The market structure in Europe for ETFs is, at best, opaque. As a result, data is difficult to access. This is in part because currently there are no reporting requirements for ETF trades both on exchange or OTC. There are many studies available and much has been written about ETFs, however, the bulk of available academic literature discusses the impact US domiciled ETFs have on underlying markets. The extent to which the outcomes arrived at from US research is applicable in a European context should therefore be considered. The question, therefore, is whether credible comparisons can be drawn between the US market and the European market, with the commentary being viewed as equally valid in a European context.
210. The structure of the US market is such that there is one central clearing repository (the DTTC). This contrasts sharply with the variety of clearing and settlement systems in Europe. In the US, ETF trade reporting is obligatory and the ETF trading model is in-kind. In Europe trading is both in cash and in-kind. It is not clear, therefore whether the results of academic research can be applied in a European context and separate analysis would need to be conducted.

Section V Questions

In addition to the questions posed above (and in addition to any observations Stakeholders may have generally), the Central Bank poses the following specific questions:

- O. The Central Bank is primarily interested in risks associated with Irish authorised ETFs and European ETFs more generally yet much of the available academic literature, analysis and data relates to US ETFs. The concern is that any analysis of Irish authorised and European ETFs may be adversely affected by reliance on US-centric materials. Is this valid? Are Stakeholders aware of EU ETF specific information that might lead to different conclusions? Will MIFID II resolve these data issues?
- P. Does the nature of an ETF have peculiarities (and therefore risks) that neither the UCITS nor MiFID regulatory frameworks, either in isolation or in conjunction, address and which we have not examined here?

Section VI: Consolidated schedule of questions

Stakeholder observations and commentary on the foregoing would be welcome, in particular views as to the validity of the matters raised above. In addition to the questions posed generally in this Discussion Paper (and in addition to any observations Stakeholders may have generally), the Central Bank poses the following specific questions:

Section I Questions

- A. Is public disclosure of the identity of APs and OLPs of an ETF of benefit and should regulators have a clearer view of the interconnectedness of the AP / OLP ecosystem? Should remuneration models of OLPs (and if relevant APs) be disclosed?
- B. Transparency is described as the feature which enables a tight secondary market price (by comparison to net asset value) to be maintained. It also provides certainty to investors in terms of exposure achieved through the ETF. It might be the case that there are other mechanisms which achieve the same goal as transparency? If ETFs are not transparent does this have unintended consequences?
- C. Is the idea of secondary market investors dealing directly with an ETF when the AP arrangements breakdown unworkable in practice or unnecessary? Is there a better way of enabling secondary market investors to dispose of their ETF shares at a price close to the next calculated net asset value when secondary market liquidity is impaired?
- D. Should ETFs warn investors that the ETF may temporarily become a closed-ended fund in certain market conditions? Would requiring an ETF to remain open-ended in a stressed market be disadvantageous to existing investors or have other unintended consequences?
- E. Is it correct to permit share classes to be structured having regard to the operational concerns of APs and the impact this may have on secondary market pricing? Are there factors (other than those noted above) that could be relevant to ETF structuring?
- F. What are the benefits or disadvantages of permitting listed and unlisted share classes within the same investment fund? Do listed and unlisted share classes

create unfairness as between investors in the same investment fund and if so, can these be mitigated or addressed?

Section II Questions

- G. Are conflicts of interest rules effective for dealing with concentrations of activities within an ETF provider's financial group (e.g. group entities could act as promoter, investment manager, AP and swap counterparty or SFT counterparty)? Are other approaches worthy of consideration?
- H. Are multiple counterparties necessary, or appropriate for ETFs? Could they expose ETFs to unintended risks and consequences?
- I. Some academic research suggests that if a synthetic ETF experiences counterparty default, the synthetic ETF is more likely to be able to deliver the performance of its underlying index if the collateral received is correlated to that index. Should collateral received (where a funded model is used) or securities purchased (where an unfunded model is used) be correlated to the index being tracked? Is this practical, particularly for example where the index tracked by an ETF is comprised of securities which may be relatively expensive to access? Is collateral quality sufficiently regulated and disclosed?

Section III Questions

- J. Are active strategies appropriate for "housing" in an ETF structure and if so, is there a limit to the type of strategy that would be appropriate? If the ETF structure provides opportunities for managers to achieve scale is there a downside to this where the strategy is active (or, if scale is achieved, its potential impact is not otherwise capable of being ascertained)?
- K. Similar to the question posed in Section I, is portfolio transparency fundamental to the nature of an ETF or are there are other mechanisms which achieve the same goal as transparency? In the context of an active ETF, is transparency essential in order to achieve a liquid market and to facilitate efficiency in pricing?

Section IV Questions

- L. Some commentators are concerned that ETFs are tracking indices of underlying stocks which are not sufficiently liquid to match the intra-day liquidity on the

secondary market which the ETF offers. This statement is quite simplistic and does not, for example, reflect that there may be much secondary market activity but very little primary market activity. UCITS, including UCITS ETFs, are subject to general liquidity management rules which should ensure that ETFs track indices of underlying stocks that are sufficiently liquid to allow the ETF to meet creation and redemption requests. Is this sufficient? What liquidity practices do ETFs follow? Are there other practices that might be appropriate for ETFs?

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- N. One of the key issues in the context of support by ETF providers is investor expectation. Investors' views about purchasing ETFs and their ability to sell may be informed by whether or not the ETF provider will support the ETF in the face of stress events. There are, however, divergent views amongst ETF providers as to whether they would support their ETFs. Is provider support a desirable objective?

Section V Questions

- O. The Central Bank is primarily interested in risks associated with Irish authorised ETFs and European ETFs more generally yet much of the available academic literature, analysis and data relates to US ETFs. The concern is that any analysis of Irish authorised and European ETFs may be adversely affected by our reliance on US-centric materials. Is this valid? Are Stakeholders aware of EU ETF specific information that might lead to different conclusions? Will MIFID II resolve these data issues?
- P. Does the nature of an ETF have peculiarities (and therefore risks) that neither the UCITS nor MiFID regulatory frameworks, either in isolation or in conjunction, address and which has not been examined here?

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SCHEDULE A

ETF Overview

1. ETFs are an investment product which combine the features of an investment fund with those of an exchange-traded security. As a result, European ETFs are authorised as a regulated fund structure under the UCITS Directive but are traded in the same way that any other listed security is (and are thereby subject to obligations arising under MiFID II, for example).

How is listing achieved?

2. An investment fund may be admitted to the “Official List” (listed) on a stock exchange. It may also be “admitted to trading” on an exchange.²⁰² A security that is listed on a stock exchange has been scrutinised by a regulator which imposes (a) conditions pertaining to those securities as well as (b) obligations on issuers. A security that has been admitted to trading has been approved by a “host” national competent authority under mutual recognition rules.
3. Listing and trading on exchange is, for UCITS ETFs, predicated on authorisation of the ETF as a UCITS. Take the case, for example, of an Irish authorised UCITS ETF which wishes to be traded on the London Stock Exchange (“LSE”). The UCITS ETF could either go directly to the LSE seek admission to listing or could utilise a parallel process with the Irish Stock Exchange (“ISE”) whereby the UCITS ETF would be listed on the ISE and, in turn, admitted to trading on the LSE.
4. In the example provided (and assuming the UCITS ETF trades on the LSE via the ISE listing) there is a two-stage process comprised of the initial authorisation and listing and the subsequent passporting both in relation to the UCITS marketing of the ETF²⁰³ and to the admitted to trading process. Firstly, the ETF will be authorised as a UCITS by the Central Bank of Ireland. The ISE listing application will run in tandem with this authorisation. This results in the regulatory approval process for both UCITS authorisation and ISE listing being achievable within days of each other.²⁰⁴ This process will also enable the UCITS ETF

²⁰² The distinction between these concepts arises from a series of EU Directives. For an overview of the origin of the distinction see the ESME report on MiFID and admission of securities of official stock exchange listing: http://ec.europa.eu/internal_market/securities/docs/esme/05122007_mifid_report_en.pdf. A security can be listed but not actually traded on an exchange. It may also be traded on an exchange but not listed on that exchange.

²⁰³ Marketing of the UCITS ETF can take place in another EU jurisdiction under Chapter XI of the UCITS Directive.

²⁰⁴ For Irish authorised UCITS ETFs, in order to achieve a listing on the ISE, the ETF must make a formal application. This is made by directors of the ETF on the basis of a listing document (typically the UCITS prospectus). The directors

to obtain a quick admission to trading on the LSE (or on certain other EEA stock exchanges by using a mutual recognition process²⁰⁵).

5. Once authorised and approved for listing the Irish UCITS ETF will go through a UCITS marketing notification process with the Financial Conduct Authority ("FCA") in order to market its shares in the UK. This typically takes 15 working days. At the same time the UCITS ETF will comply with relevant LSE operational requirements²⁰⁶ and will progress its application to have its shares admitted to trading on the LSE. Once the ETF has complied with UK UCITS marketing requirements been recognised, i.e. the passport has been granted, (and assuming the ETF provider is ready to launch the ETF) the ETF is ready to begin trading. An AP will generally subscribe for a creation unit (with the ETF thereby generating relevant market exposure). The ETF will confirm to the ISE (on the morning of listing) that shares have been issued in the ETF. The ETF will then be listed on the ISE. The following day these shares will be admitted to trading on the LSE. Only once this occurs will shares be traded in the ETF.
6. In conjunction with this listing process, the primary market dealing process will be activated by the AP(s) dealing with the ETF in order to initially issue shares in the ETF.
7. The ETF shares purchased by the AP from the ETF will then be traded on exchange. Where investors wish to purchase ETF shares they will, through their broker, place a market order for ETF shares. This order can be fulfilled either by an AP or another market participant. Purchasers of ETF shares on the secondary market are unlikely to become legal shareholders in the ETF (this is not necessarily dissimilar to any other non-ETF investment fund).

Shareholding structure

8. From the perspective of an Irish ETF (and any Irish company), the legal owner of its shares is the entity appearing on the shareholder register ("shareholder"). Irish companies are prevented as a matter of law from recognising beneficial interests in shares.²⁰⁷ Simply

will confirm to the ISE that they have included as much information as is reasonably possible in relation to the ETF so as to enable investors and their professional advisers to make an informed assessment of an investment in the ETF.

²⁰⁵ Certain stock exchanges permit an ETF listed initially on another EEA stock exchange to be admitted to trading using a simplified procedure (the LSE, Deutsche Börse and BATS permit use of this simplified procedure. Exchanges such as Borsa Italiana, do not).

²⁰⁶ For example, appointment of an Official Liquidity Provider for LSE trading purposes.

²⁰⁷ Section 170 of the Companies Act 2014 provides that "No notice of any trust, express, implied or constructive, shall be entered (a) on the register of members or be receivable by the keeper of the register; or (b) on any register kept by the Registrar." Similarly, section 53 of the ICAV Act provides that "No notice of any trust, express, implied or constructive, shall be entered on the register of members of an ICAV." The principle reflected in these legislative provisions were confirmed by Costello J., in *Alico Life International Ltd v Thema International Fund plc and HSBC Institutional Trusts Services (Ireland) Limited and Shmuel Harlap v Thema International Fund plc and HSBC Institutional Trusts Services (Ireland) Limited* [2016] IEHC 363

because an entity is a shareholder (and is therefore the legal owner of shares) does not mean that it has the beneficial (or economic) interest in those shares. However, the legal shareholder may not always have its capital at risk and consequently, it is not always sufficient to assume that the exercise of shareholder rights by a shareholder will assure the protection of an investor's interests.

9. Where an investor's shares are held in the name of and through a legal entity, (with which it has a contract for this purpose), this is known as a "nominee arrangement." The relationship between the nominee (who holds the securities) and the investor is one based on contract. The investor does not have legal entitlement to any share issued by the ETF itself. The terms on which the nominee arrangement is entered into will be set out in a contract between the legal owner (nominee) and the investor (or beneficial owner). The contract will normally provide that the nominee holds all legal rights and entitlements to the shares and that this is subject to receipt of instructions from the investor in relation to dealing with the shares. It will also define the process for the exercise of any voting rights.²⁰⁸
10. Shares of an ETF which are listed and / or traded on an EU stock exchange will be held through a nominee arrangement because of the manner in which deals in an ETF's shares must be settled. For example, where ETF shares are settled either in an ICSD or in a securities settlement system in which a CSD participates, shares will be held in the name of a participant in the ICSD or CSD. This will be an intermediated arrangement which (from an Irish perspective) effectively operates as a nominee arrangement.²⁰⁹ The nominee arrangement will be replicated a number of times in relation to a particular shareholding in that the investor may, to hold shares, use a nominee who itself has a nominee arrangement with the participant in the ICSD and / or the CSD.²¹⁰

²⁰⁸ As the nominee will be the legal owner of shares it will be permitted to vote in meetings of the ETF. It will be a matter for the nominee and the investor to agree how voting rights will be addressed and how information relating to the ETF holding will be passed from the nominee to the investor. Proposals under the draft Shareholders Rights Directive (Directive of the European Parliament and of the Council amending Directive 2007/36/EC as regards the encouragement of long-term shareholder engagement and Directive 2013/34/EU as regards certain elements of the corporate governance statement ("Draft Revised Shareholders Rights Directive")) require intermediaries to facilitate the exercise of voting rights for shareholders including the right to participate and vote in general meetings. While the objective appears to be to enable investors, the intention could be hampered by the definition of "shareholder" in the original Shareholders Rights Directive (Directive 2007/36/EU) which is limited to "*a person recognised as a shareholder under applicable law*" (and under Irish law that is the person appearing on the shareholder register). The draft Shareholders Rights Directive was adopted by the European Parliament on 15 March 2017 and will enter into force two years after publication in the Official Journal.

²⁰⁹ Where securities or shares are held in a CSD investors do not hold "shares" but rather indirectly hold securities through a chain of intermediaries between the investor and the CSD (the ultimate holder of the shares).

²¹⁰ It is important to note that the principles outlined here may not be relevant to ETFs domiciled in other (civil law) jurisdictions. This is because of the differing nature of property rights. For example, the categorisation and nature of "shares" differs as between legal systems: in the common law system (such as in Ireland and the UK) a share (or security) is an item of property which can be dealt in. By comparison, in the civil law system shares (or "securities certificates") embody an intangible property right entitlement (or right) of value which is personal to the holder. Attempts to harmonise legal regimes in Europe in relation to holdings and transfers of intermediated securities (such as the draft Directive on Legal Certainty of Securities Holding and Transactions) have not eliminated the difference.

11. An investor in an ETF will have its interest in ETF shares held through a nominee arrangement. Investors will not therefore be shareholders. It is also unlikely that APs will be shareholders. This is due to the manner in which ETF shares are settled. As explained below, how this works depends on the structure of the CSD used for settlement.
12. Where shares are settled in a securities settlement system they must be dematerialised (i.e. recorded in book-entry form at the level of the ICSD/CSD and its participants)²¹¹ and must be able to be transferred and evidenced electronically. ETF shares can either be issued directly into a CSD (in this case only CSD participants will be shareholders) or can be issued through a global share certificate²¹² in the name of the ICSD's nominee (known as a "common depositary nominee"). Where ETF shares are held in the name of the participant's nominee or where they are held in the name of the common depositary nominee, it will be the relevant nominee who is the shareholder.
13. Accordingly, where an ETF issues shares to an AP as part of a creation unit, they will be issued by the ETF into, and settled within, the AP's account at a CSD (because the AP is likely to be a participant in the CSD). Most likely, the AP's holding of ETF shares will, in common with other investors, be held through a nominee arrangement (which itself is likely to be in a chain) ultimately with a participant in the CSD. This means that the actual level of individual AP holdings will not be known to the ETF through its share register. APs can, quite legitimately, completely divest themselves of their ETF shares and it is quite possible that, at any point in time there will be no APs who are (indirectly) shareholders in an ETF. Therefore, while APs are the only entities which deal directly with the ETF (and may be assumed to be the shareholders), it does not follow that they are actually major shareholders in the ETF and there is no way for the market to know when this is or is not the case.
14. This layering of nominee arrangements (and therefore interests in shares) is a feature in many investment funds irrespective of whether they are, or not, exchange-traded. Many investment funds also issue into (and are settled within) an ICSD/CSD. ETFs are settled, and are processed in the same way as any other share is settled and processed within an ICSD/CSD. However, the layering in relation to ETFs coupled with an inability to deal directly with the ETF places the beneficial owners, quite legally and legitimately, at an

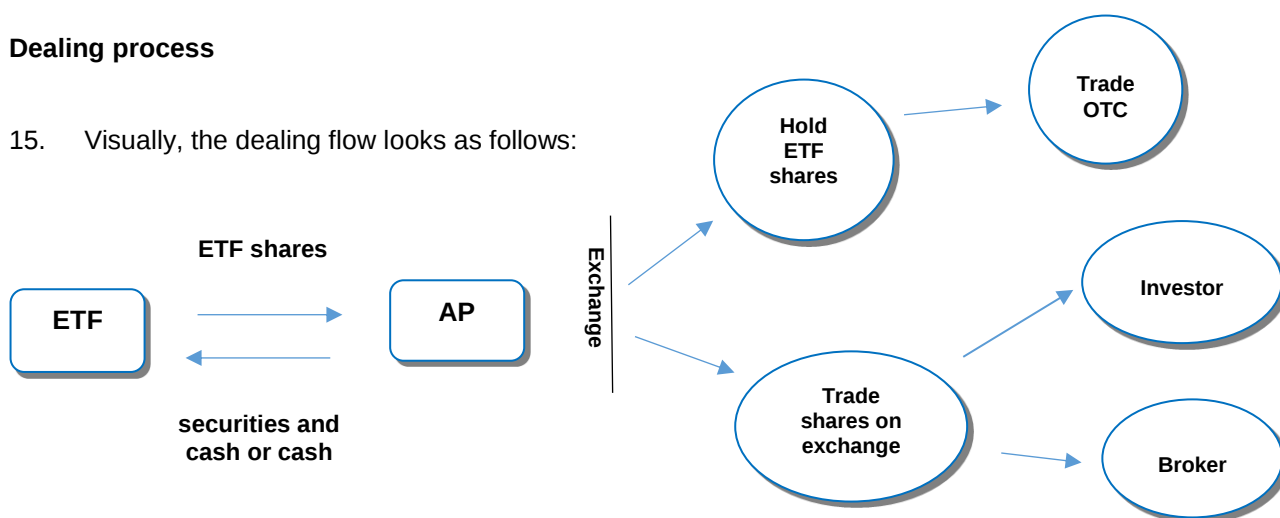
²¹¹ Dematerialised shares are issued by an ETF pursuant to the Companies Act 1990 (Uncertificated Securities) Regulations 1996. These regulations also prevent the ETF from recognising trusts on a register. Regulation 10(6) provides that "No notice of any trust, expressed, implied or constructive, shall be entered on a register of securities which is maintained by virtue of paragraph (3) in relation to uncertificated units of a security, or be receivable by the registrar of such a register."

²¹² Shares represented by a global share certificate are described as "immobilised."

additional distance from the ETF. This may not be consonant with their sense of their ownership interest.

Dealing process

15. Visually, the dealing flow looks as follows:



16. APs can deal with an ETF either in cash or on an in-kind basis, as prescribed by the ETF.
17. It is important to note that irrespective of whether an AP deals with an ETF on an in-kind or on a cash basis the net receivable by the ETF is the same; the ETF receives consideration for the creation unit²¹³ which is equivalent to the aggregated net asset value of all the shares subscribed for (in the creation unit). There should be no economic difference to the ETF whether it accepts deals in-kind or in cash. This is because of the mechanism by which the dealing costs are allocated to the AP.²¹⁴ The net effect of the mechanism for allocating dealing costs is that the subscribing or redeeming AP bears the dealing costs of transferring the securities to the ETF (in the case of an in-kind deal) or the costs associated with the ETF having to invest the cash by purchasing underlying securities (in the case of a cash deal).

²¹³ A creation unit is a fixed number of ETF shares (for example, 50,000 shares) or a minimum cash amount set at a similarly high level.

²¹⁴ If an ETF were to bear dealing costs in the same way as an investment fund, the ETF would experience "tracking error" because the methodology underlying the index being tracked by the ETF would not take account of the need to purchase and sell securities to reflect primary market deals. The performance of the ETF would therefore diverge from the performance of its index. For this reason, ETFs are structured so that dealing costs associated with creation and redemption activity are passed to the AP. These dealing costs include (a) in the context of a subscription, any cost which relates to the cost of purchasing underlying securities or generating relevant exposure (in the case of a cash creation) or the cost of registration of underlying securities in the name of the ETF (in the case of an in-kind creation). These costs could include stamp duties, brokerage fees, custodian fees, bank charges and taxes; and (b) in the context of a redemption, any cost associated with the sale of securities and delivery of cash to the redeeming AP (in the case of a cash redemption) or the cost of delivery of underlying securities to the redeeming AP (in the case of an in-kind redemption). These costs could include brokerage fees, transfer agent fees, bank charges, registration fees. The precise scope of dealing costs which can be charged to the AP on a creation or redemption will be specified in the ETF's constitutional documents and prospectus.

Why structure an ETF as in-kind or cash dealing?

18. The original ETF structure was created in the United States using the in-kind dealing model. The primary driver for this is tax-related.²¹⁵ When European ETFs were first established they were structured so as to mimic the US model. This, we understand from industry participants, was on the assumption that the tax issues prevailing in the US were relevant in a European context also. This is not however the case and the dealing model for European based ETFs while originally based on an in-kind dealing model is now predominantly cash based (with up to 95% of the market for equity based ETFs being cash-based dealing and approximately 90% of the market for fixed income ETFs dealing in cash).²¹⁶
19. An ETF may require cash dealing because of the nature of its assets. For example, the ETF may deal in cash because it generates its exposure through a derivative instrument (typically a swap²¹⁷) or the ETF may invest in securities in respect of which there may be legal restrictions preventing in-kind transfers.
20. Cash dealing models offer certainty for the AP in terms of dealing and settlement. This is because it enables the AP to receive the ETF shares represented in the creation unit upon payment of cash (under the delivery versus payment (DVP) settlement mechanism). This provides both the ETF and the AP with greater risk control over the transaction.²¹⁸

²¹⁵ The Central Bank understands that in the US, where an investment fund sells securities within its portfolio (for example, to enable a redemption of cash or to rebalance a portfolio) a capital gain will arise to the fund. These capital gains must be paid to shareholders. In an in-kind dealing model, the AP receives underlying securities in return for the re-delivered ETF shares. As there is no sale, no capital gains tax arises.

²¹⁶ A meeting with industry participants in September 2016 estimated that cash dealing levels accounted for 95% of the deals in equity based European ETFs. At that meeting it was also estimated that between 90% and 95% of the fixed income market dealt on a cash basis. Because, however, most cash deals are on a directed cash basis (see further at footnote 181) it is necessary to consider the mechanism of in-kind dealing.

²¹⁷ A derivative contract between the ETF and a counterparty and is incapable of delivery to the ETF on an in-kind basis.

²¹⁸ Cash dealing in an ETF can take one of two forms; a cash actual deal or a "directed" cash deal. A cash actual deal is simply the exchange of cash for a creation unit. The trade will be DVP and so the AP does not bear the settlement risk it would be exposed to in an in-kind deal where it delivers securities to the ETF. A directed cash deal occurs when the AP agrees with the ETF that it will subscribe for a creation unit in cash but that the purchase of securities which follows the creation will be routed through a particular broker or channel, generally the AP's own trading desk. While it is a cash deal (and therefore a DVP trade which is of benefit to the AP), there is an in-kind aspect to it as the AP will be responsible to the ETF for delivery of relevant securities as well as bearing the risk associated with partial or non-settlement of these securities. The AP will also be responsible for dealing costs associated with the purchase of relevant securities. An AP may seek to structure a creation or redemption as a directed cash deal for a number of reasons. For example, because the purchase or sale of securities is being routed through its own (or a related) trading desk, there may be efficiencies in terms of the cost of execution. In this way, the dealing costs for which the AP will be responsible can be lessened. Additionally, the AP may have hedged its exposure to the ETF (arising as a result of a creation order placed with an ETF) by purchasing relevant securities during the trading day. The AP will therefore be able close out its hedge by selling these securities to the ETF as part of the terms of the directed cash creation (and so market participants can themselves categorise a cash directed deal as an in-kind deal as they view it as selling securities to the ETF. The statistics on cash dealing and in-kind dealing should therefore be read with an appropriate caveat). In either circumstance the AP will deliver to the ETF an amount of cash representing the aggregate net asset value per share in a creation unit (i.e. if there are 50,000 shares in a creation unit the price will be the net asset value per share multiplied by 50,000). This will be in addition to relevant dealing costs.

21. By way of contrast, in-kind dealing is carried out on a free of payment (FoP) basis which means that the AP does not receive the creation unit until such time as all the securities required by the ETF have been delivered to the ETF. This exposes the AP to settlement risk as the AP must deliver all securities required by the ETF in order to receive the ETF shares. If there is a settlement failure for even a minimal portion of the securities required by the ETF, the AP will not receive any (or even a *pro rata* portion) of the ETF shares which are comprised in the creation unit.²¹⁹

In-kind dealing

22. The first question for an AP when it wishes to deal with an ETF on an in-kind basis relates to the securities to be delivered to the ETF in the context of a creation and, where there is a redemption order, what securities the AP will receive in return for the ETF shares.
23. Where the ETF tracks the performance of an index it could be assumed that the AP simply delivers a basket of securities which are weighted in the same way as the index. This is not the case. Simply because an ETF tracks an index does not mean that the ETF holds a vertical “slice” of the index. By way of example, take an ETF which tracks the performance of a specified market index such as the S&P 500 Index. Constituents of this index are equities of the top five hundred companies (by market capitalisation) listed on the New York Stock Exchange or NASDAQ. This ETF will seek to track the performance of the S&P 500 index either by holding equities of all five hundred constituent issuers or by holding a subset of those equities which, together, seek to represent the performance of the index as a whole. An ETF tracking the performance of this index is not obliged to (but may) hold all constituent securities. In these circumstances the ETF will seek to manage the securities delivered to it so that the manner in which it tracks the performance of the index is not adversely affected by the securities it receives.
24. The ETF will therefore have specific requirements for securities delivered (either to, or from, the ETF) reflecting the portfolio manager’s views on how best to manage the ETF portfolio. As a result, identification of the securities which need to be delivered to, or transferred out by, the ETF is a fundamental feature of the in-kind dealing process.

²¹⁹ In the United States, ETFs often accept what is known as “cash collateral” from APs for missing securities. This is a facility which is enabled by DTTC, the US clearing and settlement system used by US ETFs. It operates so that where an AP is unable to deliver requisite securities to the ETF it may post cash (typically with a value in excess of the missing securities) to the ETF as collateral for the missing securities. This will enable the AP to receive the ETF shares comprising the creation unit despite the fact some securities were not delivered. This is not a facility seen in Europe and, while this flexibility is seen in prospectus documents of UCITS ETFs, we understand from discussions with industry that this mechanism is not typically used.

25. The portfolio composition file (“PCF”) will set out the amount of securities and cash to be delivered to the ETF in return for a creation unit. In its simplest form the PCF is a file, published on behalf of the ETF, which contains (a) the consideration the ETF wishes to receive from an AP in order to issue a creation unit, and (b) the consideration the ETF will pay out to an AP for creation unit redemptions. Where the ETF deals on a cash basis the PCF will contain an amount of cash. Where the ETF deals on an in-kind basis it will contain a pre-defined basket of shares in addition to a sum of cash, called the cash component.
26. There is no single methodology which determines the contents of a PCF as this will be dependent on the manner in which the ETF’s portfolio is managed. PCF construction is a highly technical process which is very often underpinned by trading models which determine the optimal securities in which the ETF should deal as part of the creation and redemption process.

Portfolio Composition File

27. A PCF contains one or more schedules setting out the securities and cash which the AP will
 - a. deliver to the ETF (in the case of a creation) (a “creation basket”), and
 - b. receive from the ETF (in the case of a redemption) (a “redemption basket”).

The securities in the creation basket and the redemption basket will be delivered to, or received from the ETF in respect of the dealing day for which it is published.

28. The PCF will also contain a “pricing basket” which addresses both transparency and pricing needs of APs and OLPs.
29. The securities in the PCF may or may not be index constituents but they will reflect the manner in which the ETF’s portfolio is managed.
30. A PCF can have schedules that are structured as either a “multi-basket” or a “single basket”.
31. A PCF comprised of a multi-basket PCF²²⁰ can contain a variety of different schedules representing different baskets of securities. These will be used to meet requirements for

²²⁰ The multi-basket PCF enables the ETF to efficiently meet investment objectives, manage transaction costs, lessen the impact of taxation, access illiquid securities and manage other compliance-related events which would not be possible within the single basket model.

creations, redemptions and pricing. While there is no single “formula” for basket construction or contents, the following baskets can be established in accordance with the ETF’s particular specifications: “creation basket,” “redemption basket,” a “holdings basket,”²²¹ a “pricing basket.”²²² An ETF may also permit creation on the basis of a “customised basket”.²²³

32. A PCF comprised of a single basket contains a single schedule of securities which generally represents a “slice” of the ETF’s portfolio and will only contain securities actually held by the ETF (because the ETF will have to hold the securities in order to be able to deliver them to the AP on a redemption). As such, a single basket is used for creations, redemptions and pricing.²²⁴

²²¹ This generally reflects the actual holdings of the ETF. Publication by the ETF of its holdings can address a number of regulatory and operational requirements; for example, it will facilitate transparency of the ETF’s holdings which is required as a result of regulatory or listing obligations and can form the basis of the iNAV calculation. It can also meet the needs of APs who, on an intra-day basis, price the ETF shares for on-exchange trading. The holdings basket will show the AP what is actually being held by the ETF and so the AP will be enabled to effect the necessary hedging. This is ultimately beneficial to secondary market investors as tighter hedging can contribute to tighter spreads on the secondary market.

²²² This facilitates a more accurate pricing of the ETF and provides a clearer representation to the market of the AP’s actual exposure when dealing with the ETF. It might be required to address the specificities of securities held by an ETF. For example, the laws of different jurisdictions may prevent foreign investors acquiring a so-called “local” shares of an issuer. Instead, foreign investors may only be able to obtain the same exposure through shares designed specifically for foreign investors. In this example, foreign classes of securities could trade less frequently to “locally available” securities of the same issuer. Therefore, while the ETF would, as a foreign investor, hold securities available for foreign investors, it may not accurately reflect the true value of the exposure. This could, in turn, result in pricing difficulties for APs and market makers who may not be able to accurately hedge their exposure (with a resultant impact on secondary market investors as a result of widening spreads). In this instance the pricing basket could list the locally available securities. It would also exclude the foreign class of securities. This will, in turn, provide a more accurate value of the securities (because they are traded more frequently).

²²³ In a “customised basket” the AP provides to the ETF a schedule of securities which are available for transfer to the ETF in return for a creation unit. This schedule is analysed and securities are selected based on factors including compatibility with the index tracked by the ETF and the investment manager’s strategies for managing the ETF (i.e. are securities in the schedule “substitutable” for index securities). The overall aim will be to analyse the schedule of securities provided and thereby select those which are compatible with the ETF and its management strategy and to disregard those which are not. The customised basket addresses specific circumstances where the creation baskets might be limiting for an AP. For example, as the customised basket has been constructed to contain securities which are generally available for delivery (rather than those selected solely by reference to their being index constituents) an AP with securities which are not in the creation basket would be prevented from creating with the ETF. The customised basket could also represent an opportunity for APs to “offload” securities on the ETF which are not, perhaps, as liquid or as accessible as might be desirable but which are index constituents (while this may, on its face appear undesirable, it is still consistent with the ETF’s objective which is to track an index by holding index constituents). The customised basket could also be used by the ETF to identify securities which are expected to be included in a future index re-constitution (and in this way represents a further tailoring of a creation basket).

²²⁴ This is not an optimal way to approach portfolio management from the ETF’s perspective because the ETF will have to reflect necessary portfolio changes (for example, rebalancings, adjustments to weightings) by purchasing and selling portfolio holdings rather than being in a position to managing these changes “up front” as part of the dealing process. The ETF will therefore incur transaction charges, its portfolio turnover rate (i.e. the level of transactions carried out within a fund’s portfolio) will increase and there will be a consequential negative impact on the ETF’s tracking of its index (specifically, the ETF will have to incur costs arising from buying and selling securities within its portfolio. The index tracked by the ETF will not assume there are similar costs. Therefore, the ETF’s performance (as compared to the performance of the index) will diverge due to the transaction costs

How and when does the AP source securities for in-kind creations?

33. An AP can continuously trade in ETF shares during the course of the trading day. It can sell a quantity of ETF shares that it does not physically hold and then place a creation order with the ETF for a creation unit. As discussed above, an AP which seeks to create with an ETF will know at the beginning of a trading day what securities (and quantity of securities) need to be delivered to the ETF in respect of a creation for that trading day.
34. Where the AP has sold ETF shares on the market that need to be covered by a creation order, which will only be placed at the end of the trading day, the AP will have a risk exposure. The exposure is that the value at which it will have to purchase shares from the ETF will cost more than the amount it receives from the sale of ETF shares. The AP will, therefore, need both to place a creation order with the ETF and hedge its exposure to the creation order. This can be done in a number of ways (including for example through the use of futures). However, the AP will often place market orders for securities required in the creation basket during the course of the trading day in order that it can then transfer them to the ETF, either as an in-kind or a directed cash deal, in consideration for a creation. Alternatively, the AP can utilise its own inventory to satisfy the creation.

Arbitrage activity of APs

35. The arbitrage activity of APs can contribute to keeping the exchange-traded price of the ETF and its net asset value close. At the outset it should be noted that use of the term “arbitrage” is slightly inaccurate in an ETF context as a “pure” arbitrage implies a strategy which is riskless. This is not the case for the trading process carried out by APs and other market participants as these trades can imply or involve a degree of risk and as such is more akin to “risk arbitrage.”²²⁵ Where “arbitrage” is referred in this section it should, therefore, be read as referring to risk arbitrage.
36. The closeness with which the secondary market price of ETF shares trade to the ETF's net asset value, however, will not be solely dependent on the success (or otherwise) of arbitrage. The secondary market price will incorporate premiums (or spreads) which reflect factors driven by the risk exposure of the AP, illiquidity or other stresses in the underlying market.²²⁶

²²⁵ For example, an arbitrageur could be exposed to the risk of non-simultaneous purchase and sale of the ETF shares and underlying securities. Alternatively, where the underlying securities are illiquid or the underlying market is closed, the trading costs or price of purchase of underlying securities could vary.

²²⁶ Petajisto, Antti (2017).

37. There is much discussion about the arbitrage trading engaged in by APs and other market participants. Arbitrage is possible for APs because the ETF will disclose details of its portfolio to the market via the PCF. This enables the AP, in turn, to calculate a real-time value for the ETF. As the securities of the portfolio trade daily, there will be differences in the actual value of the securities and the value of all of the securities comprised in the ETF portfolio (which are valued once a day). The AP is therefore able to calculate what it sees as the “fair value” of the ETF (because it has priced individual securities) and can view the difference between that price and the market price of the ETF shares.²²⁷
38. For example, where ETF shares trade at a premium to their net asset (i.e. the shares are trading at a price which exceeds the value of a proportionate amount of underlying securities in the ETF), APs are incentivised to create with the ETF. This is because they can sell ETF shares on exchange and create with the ETF by delivering securities in the creation basket to the ETF (which securities were purchased at an aggregate price which is less than that of the exchange-traded price).²²⁸ This process results in the ETF share price dropping on exchange and potentially an increase in the net asset value of the ETF (as resulting demand increases the value of the ETF’s underlying securities) which reduces the premium.²²⁹
39. Where ETF shares trade at a discount to their net asset value (i.e. the shares are trading at a price which is less than the value of a proportionate amount of underlying securities in the ETF), APs are incentivised to redeem with the ETF as they can buy ETF shares on exchange and redeem with the ETF, receiving securities in the creation basket at an aggregate price which is more than that of the exchange-traded price. This process results in the ETF share price increasing on exchange and potentially a reduction in the net asset value (as the resulting sale of securities puts downward price pressure on the securities) which reduces the premium.
40. The opportunity to arbitrage is not limited to APs and can be engaged in by other (non-AP) market participants. This arises as a function of the fact that both the ETF and the securities in which it invests are traded instruments. This provides investors with the opportunity to purchase the cheaper asset and sell the more expensive. The Central Bank understands from discussions with market participants that pure arbitrage opportunities are limited in

²²⁷ <https://www.blackrockblog.com/2012/10/11/meet-the-market-makers-the-etf-ecosystem-at-work/>.

²²⁸ This will serve as a hedge to the sale of ETF shares with the hedge being closed out via the creation.

²²⁹ Ben-David, Izhac, Franzoni, Francesco, and Moussawi, Rabih, (2012) *ETFs, Arbitrage and Contagion* Working Paper. (Ohio State University, University of Lugano and the Swiss Finance Institute, and University of Pennsylvania). Available at SSRN: <https://ssrn.com/abstract=1967599>

Europe with one participant describing them as being “extremely rare” and “not worth doing.”

OTC purchases

41. An investor can also purchase ETF shares on an OTC basis. This means that investors can interact between themselves to trade in ETF shares. Whether an investor wishes to trade on-exchange, or OTC, can depend on the size of the trade that it wishes to place. The size of deals placed on an OTC basis are generally much larger than those traded on-exchange. The Central Bank understands that this could relate to cost as there are efficiencies to trading OTC insofar as there are no exchange costs. Additionally, if an investor wished to place a particularly large deal, it could, if placed on exchange potentially move the market and so it may be preferable for that investor to deal OTC.

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