FSB Report on Market Fragmentation

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Executive summary

International cooperation and coordinated action by financial authorities have strengthened the global financial system in the aftermath of the global financial crisis. A programme of regulatory reforms agreed by the G20 Leaders has addressed many of the fault lines exposed by the crisis; the FSB and standard-setting bodies (SSBs) have established programmes to monitor progress in their implementation and evaluate its effects. Authorities have also intensified their international cooperation.

There are, however, concerns that some markets may be fragmented along jurisdictional lines. Market fragmentation can arise for a number of reasons, including differences in national regulations and supervisory practices governing financial activities that are international in nature. This, along with differences in both the substance and timing of implementation of international standards, may disincentivise or prevent market participants from undertaking certain cross-border activities.

The 2019 Japanese G20 Presidency proposed that the FSB explore issues around market fragmentation and consider tools to address them, where appropriate. This report focuses on instances where reducing market fragmentation might have a positive impact on financial stability, or improve market efficiency without any detrimental effect on financial stability. It includes a review of literature on this topic, a stocktake of work by SSBs and other international bodies, two case studies, as well as feedback from a workshop held with representatives from the private sector.

Regulatory reforms in response to the financial crisis have been supportive of global financial integration. Policy measures aimed at reducing systemic risk and strengthening the resilience of the financial system, including the availability of adequate resources to absorb shocks across jurisdictions, were key to restoring confidence in internationally active financial institutions and provided the basis for a resumption of cross-border financial activity in the aftermath of the crisis.

Some types of market fragmentation might nonetheless be a by-product of measures to improve domestic resilience. Such fragmentation can, for instance, be the result of cross-jurisdictional differences in regulations and supervisory practices that reflect domestic policy mandates and responsibilities. In places, such fragmentation of markets can have a positive effect on financial stability. For example, it can reduce the transmission of economic shocks between jurisdictions, and increase the resilience of domestic or global financial markets. Measures that provide reasonable certainty to financial institutions' host jurisdictions can also help encourage cooperation in a stress, avoiding more harmful forms of intervention at these times.

Other types of market fragmentation may reduce the resilience of both global and domestic financial systems. This might be the case where fragmentation limits opportunities for cross-border diversification and risk management, impairs market liquidity or prevents capital and liquidity from being channelled to where it is needed in periods of stress. Such market fragmentation may reduce the efficiency of cross-border investment and risk management, and thereby increase costs faced by end investors through inefficient resource allocation.

The report looks at some examples of financial activities where supervisory practices and regulatory policies may give rise to market fragmentation (either intended or unintended). It discusses potential trade-offs that authorities have considered between the benefits of increased cross-border activity and a need to tailor domestic regulatory frameworks to local conditions and mandates. The areas the report examines are the trading and clearing of over-the-counter (OTC) derivatives across borders; banks' cross-border management of capital and liquidity; and the sharing of data and other information internationally.

The report does not attempt to assess the significance of market fragmentation in specific areas or evaluate possible effects on financial stability or market efficiency. Instead, it discusses in general terms the potential linkages between market fragmentation and financial stability in different areas. On this basis, the report lays out approaches and mechanisms that may enhance the effectiveness and efficiency of international cooperation, and help to mitigate any negative effects of market fragmentation on financial stability. Such approaches and mechanisms are not designed to re-open agreed international standards, change institutional responsibilities and setups or add unduly to administrative burdens.

These approaches could include the more systematic consideration and clarification of whether there are possible fragmentary effects of regulation, both as international standards are being developed and during their implementation by national authorities. Possible approaches could also involve greater cross-border communication and information sharing among authorities, including via existing fora such as supervisory colleges and crisis management groups (CMGs), and the alignment of data collection. Fragmentation might also be addressed via measures that increase the ability of authorities to compare regulatory regimes across jurisdictions, including those that might facilitate decisions concerning recognition and deference.

This report also identifies several areas for further work to address market fragmentation. These focus on facilitating further analysis and discussion of approaches and mechanisms for more efficient and effective cross-border cooperation amongst authorities. Such areas for further work include: exploring ways to, where justified, enhance the clarity of deference and recognition processes in derivatives markets; strengthening the understanding of approaches by supervisory and resolution authorities towards pre-positioning of capital and liquidity by international banks; considering ways to enhance supervisory communication and information sharing, including approaches and mechanisms to avoid future fragmentation; and considering whether there is evidence of market fragmentation with observed consequences for financial stability as part of the FSB's ongoing evaluation of the effects of too-big-to-fail reforms.

The FSB will review progress on this further work to address market fragmentation in November 2019.

1. Introduction

This report discusses market fragmentation, focusing on instances where reducing market fragmentation might have a positive impact on financial stability, or improve market efficiency without any detrimental effect on financial stability. The G20 has long been committed to implementing financial reforms in a way that supports an integrated global financial system.[1] In their 2018 Buenos Aires Summit Declaration, G20 Leaders stressed that "an open and resilient financial system, grounded in agreed international standards, is crucial to support sustainable growth" and reiterated that they "will continue to monitor and, if necessary, tackle emerging risks and vulnerabilities in the financial system; and, through continued regulatory and supervisory cooperation, address fragmentation". The 2019 Japanese G20 Presidency proposed that the FSB examine signs of market fragmentation and explore issues around market fragmentation and tools to address them, where appropriate.

The report discusses the relationship between cross-border market fragmentation and financial stability, both in general terms and in a number of specific areas. It discusses fragmentation across jurisdictions that may arise from financial regulation and supervision and identifies mechanisms and processes that authorities can use to reduce harmful effects on financial stability. The report does not consider other forms of market fragmentation, including across financial sectors within a jurisdiction, or decentralisation of financial services beyond national boundaries as a result of new technologies. The lessons from this report may feed into future work, including initiatives by the FSB.[2]

The report includes a stocktake of the SSBs' work on market fragmentation[3] as well as relevant literature. The issues in this report were also discussed at a workshop with external stakeholders, which included representatives from academia, financial institutions and industry associations. Summaries of these inputs are provided in the Annexes.

The next section of this report defines market fragmentation, and discusses its drivers and the manner in which it can impact financial stability and market efficiency. Some supervisory and regulatory policies that may give rise to market fragmentation, and actions taken by authorities, are discussed in Section 3. Case studies are also provided in annexes to give some further detail. Section 4 discusses potential mechanisms and approaches to reduce harmful market fragmentation in a manner that either improves financial stability, or increases market efficiency without impairing financial stability. These aim to enhance the effectiveness of regulatory and supervisory resources and cooperation. They do not aim to re-open agreed international standards, change existing institutional responsibilities and setups, or add undue administrative burdens. Section 5 sets out areas for further work by the FSB that aim to address

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1 When G20 Leaders set out the global reform agenda at Pittsburgh in 2009 they said: "We are committed to take action at the national and international level to raise standards together so that our national authorities implement global standards consistently in a way that ensures a level playing field and avoids fragmentation of markets."

2 Some of these issues will be covered in the FSB's evaluations of the effects of post-crisis financial reforms.

3 Respondents to the survey include: the Basel Committee on Banking Supervision (BCBS), the Committee on Payments and Market Infrastructure (CPMI), the International Association of Insurance Supervisors (IAIS), the International Monetary Fund (IMF), the International Organization of Securities Commissions (IOSCO), the Organization for Economic Co-operation and Development (OECD) and the World Bank.

market fragmentation through enhanced cross-border cooperation. These initiatives build on relevant work already underway within the FSB and SSBs.

IOSCO is publishing a report[4] by a Follow-Up Group to its 2015 Task Force on Cross-Border Regulation[5], which it established to better understand where and why regulatory-driven market fragmentation in wholesale securities and derivatives markets is occurring, and what action(s), if any, IOSCO and its members could pursue to minimise its adverse effects. The FSB has coordinated with IOSCO in setting out areas for further work in this report, including to mitigate the risk of overlap between potential work streams in both organisations.

2. Market fragmentation and financial stability

There is no commonly agreed definition of market fragmentation. The term is generally used to refer to markets that fragment either geographically or by type of product or participant. This paper only discusses fragmentation along geographical lines.

Market fragmentation can manifest itself in a number of ways. One symptom may be a limited presence of foreign providers of financial services within a given jurisdiction. Another may be a reduction in cross-border capital flows and/or the existence of multiple prices for the same or economically similar financial assets across different jurisdictions or markets. A further symptom may be the segregation of levels of capital and liquidity within local markets that go beyond those commensurate with local risks, or a reduction in the availability of financial services for end-users.

There are a variety of reasons for market fragmentation, not all of which are undesirable or attributable to the effects of regulation and supervision. What may sometimes appear as fragmented markets can simply reflect investor preferences either as to the location of their investment (e.g. home bias) or of their trading (e.g. via venues with varying degrees of price and counterparty transparency). Similarly, bank business models may rely on local funding or decentralised operation more generally. Finally, fragmentation can also reflect differences in the development of financial systems (e.g. the depth and breadth of capital markets, relative sophistication of banks) as well as a range of domestic policies (e.g. taxation, competition, capital controls).

Effective international regulatory and supervisory cooperation is an important precondition for integrated financial markets and cross-border financial activity. In the aftermath of the financial crisis, policy measures to strengthen the resilience of the financial system, including the availability of adequate resources to absorb shocks across jurisdictions, were key to restoring confidence in internationally active financial institutions and provided the basis for a resumption of cross-border financial activity. More generally, sound regulation and supervisory practices reduce the probability of financial stress, which typically disrupt cross-border financial activity in particular.

Financial regulation and supervision may, however, give rise to market fragmentation, particularly when causing frictions in financial activities that are international in nature. This

[4] IOSCO (2019), Market Fragmentation and Cross-border Regulation, June

[5] IOSCO (2015), Task Force on Cross Border Regulation – Final Report, September.

can occur when national or regional rules diverge. Policies with extraterritorial effects can also heighten such divergence if they require institutions and investors to take duplicative or potentially incompatible actions to comply with overlapping regulatory requirements from different jurisdictions. Fragmentation may also arise due to differences in the timing or substance of jurisdictions' implementation of international principles or standards. This is particularly the case where the requirements of financial institutions' home and host regulators and supervisors overlap or are inconsistent. As a consequence, market participants may be discouraged or prevented from undertaking certain cross-border activities.

Market fragmentation that may result from differences in regulatory standards and supervisory practices across jurisdictions may strengthen the resilience of domestic financial systems. Such differences may reflect jurisdictions' differing stages in the economic or financial cycle, varying degrees of financial development, or differences in domestic market structures, customs and policy priorities. As such, they may increase the resilience of domestic financial systems and reduce the transmission of stress or risks across borders and thus serve as firewalls.

There may also be instances in which such differences in regulations and supervisory practices have adverse effects on the resilience of the global financial system. The segmentation of institutions and markets across jurisdictional lines can reduce opportunities for cross-border diversification and risk management, particularly by investors and institutions that manage their capital and liquidity on a global basis. Differences in rule-making could also lead to cross-border regulatory arbitrage and a potential build-up of risks in parts of the global financial system that go beyond those addressed by individual national authorities. Fragmentation of institutions' operations across borders may prevent capital and liquidity from being channelled to those entities in need of additional resources during periods of stress. Such potential effects on global financial stability, and the associated negative spillbacks on domestic financial markets, may affect authorities' assessment of the overall effects of market fragmentation. As a consequence, regulatory authorities may have to consider potential trade-offs between the benefits of increased cross-border financial activity and a need to tailor domestic regulatory frameworks to local conditions.

Relatedly, market fragmentation can reduce the efficiency of global financial markets. It may limit the breadth or increase the cost of financial services provided to end-users. For instance, the fragmentation of financial markets into multiple trading venues that are not accessible by the same users can increase the cost of cross-border investment and risk management. In some cases, such a reduction in market efficiency may also adversely affect global financial stability, for example if it significantly impairs market liquidity. In other cases, market fragmentation may increase the costs of intermediation or reduce the availability of financial services to end-users, but without adversely affecting financial stability.

3. Supervisory and regulatory policies and market fragmentation

This section examines some examples of activities where supervisory and regulatory policies may give rise to market fragmentation in a manner that impacts financial stability and market efficiency. It draws on the FSB workshop with external stakeholders, discussions among FSB member authorities and the stocktake of work on market fragmentation by international bodies. These examples include the cross-border (i) trading and clearing of OTC derivatives;

(ii) management of banks' capital and liquidity; and (iii) information sharing. The examples are meant to illustrate the types of issues that can arise with respect to the interrelationship between market fragmentation and domestic/global financial stability described in Section 2.

3.1 Trading and clearing of OTC derivatives across borders

The trading and central clearing of OTC derivatives has, in places, become segmented along geographic lines. Some of this fragmentation arises from the manner of national implementation of G20 reforms to OTC derivatives markets, which include internationally agreed goals around the central clearing and platform trading of standardised OTC derivatives, as well as margining and reporting requirements.[6]

Such post-crisis reforms have had the benefit of improving transparency and risk management and reducing systemic risk, as well as strengthening the oversight of trading venues. However, potential fragmentation of OTC derivatives markets has arisen from two types of national regulatory action:

- Differences in the substance and timing of national implementation of standards; and
- National policies with extraterritorial effects.

In the OTC derivatives market, deference has been used, in a number of specific cases, to reduce the risk of negative consequences from inconsistent regulatory requirements or extraterritorial effects.

3.1.1 Differences in the substance and timing of national implementation of international standards

The G20 commitments to reform OTC derivatives markets agreed at the Pittsburgh Summit are high-level rather than granular, as are some of the international standards that have followed from them. While FSB member authorities agreed to implement reforms in a manner consistent with international standards and authorities typically aim to achieve consistent outcomes, differences have arisen in their implementation. This may be due to the complexity and extent of the regulations that authorities have needed to develop to implement the reforms and varying legal and regulatory contexts across jurisdictions.

Some market participants and authorities have noted the potential for market fragmentation resulting from the uneven or uncoordinated implementation of these standards. Examples raised have included differences in the scope of contracts or counterparties covered by central clearing or trading mandates.[7]

Even in the absence of differences in the substance of national implementation of globally-agreed standards, market distortions and fragmentation pressures can occur due to differences in the timeframe over which they are implemented. There have been wide differences in timing in the implementation of central clearing and platform trading reforms, which were originally

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6 For information on the implementation of OTC derivatives reforms, see FSB (2018), OTC derivatives markets reforms: thirteenth progress report on implementation, November.

7 FSB (2017), Review of OTC derivatives market reform: Effectiveness and broader effects of the reforms, June.

intended to be completed by end-2012, but in some jurisdictions are still not fully implemented. Some market participants report that these have led to fragmentation. In addition, the BCBS-IOSCO uncleared margin requirements were implemented at different times across jurisdictions after they had been agreed at a global level.[8] This resulted, at least temporarily, in reports of market participants shifting activity away from counterparties in certain jurisdictions as banks undertaking similar business faced different national requirements.[9]

3.1.2 National policies with extraterritorial effects

Another source of market fragmentation may stem from cross-border effects of jurisdictions' laws or regulations, where these are not accompanied by suitable processes for international cooperation and coordination between authorities.

Regulations that require activities to be conducted in a certain location can segment markets. One example of such regulation is requirements in some jurisdictions that certain types of transactions (typically those denominated in that jurisdiction's currency) be centrally cleared at local central counterparties.

The motivation for such location requirements can be to enhance domestic financial stability. Globally, the use of central clearing has greatly increased in recent years, which is an intended effect of the reforms. The FSB and SSBs have been working to promote CCP resilience, recovery planning and resolvability.[10]

Location policies are one of the channels through which national authorities can have direct oversight over individual financial market infrastructures that are highly interconnected with the rest of the financial system.[11] They can also facilitate the involvement of national authorities, including in any decisions over liquidity support, in the event of crisis. Such measures are a last resort along a spectrum of means – including cooperation agreements and supervisory colleges – through which national authorities can seek to manage risks of such systemically important infrastructure when other mechanisms have failed or are deemed insufficient.

Location policies can reduce the ease with which market participants can transact across borders and reduce the efficiency of firms' risk management by increasing their cost of hedging in the deepest and most liquid markets.[12] They may also reduce the financial stability benefits and market efficiencies arising from multilateral netting, particularly if end-investors using a given CCP have similar directional exposures to certain asset classes. In the event of a clearing member's default, this may complicate the CCP's management of a defaulting member's positions.

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[8] As an illustration of these timing differences, some jurisdictions operationalised these requirements on 1 September 2016, and others on 1 February 2017, while some jurisdictions gave relief running until 1 September 2017.

[9] FSB (2017), page 37.

[10] BCBS, CPMI, FSB, IOSCO (2017), Chairs' Report on the Implementation of the Joint Workplan for Strengthening the Resilience, Recovery and Resolvability of Central Counterparties. July.

[11] For an analysis of interconnectedness, see FSB, CPMI, IOSCO, BCBS (2018), Analysis of Central Clearing Interdependencies, August.

[12] ISDA (2019), Regulatory Driven Market Fragmentation, January.

The long-term economic significance of the reduction in these economies of scale that result from location policies is unclear. Some research suggests that the costs associated with imposing location policies on central clearing can be substantial, given the fragmentation to which they give rise. Other research has suggested that, even in the presence of location policies, other economies of scale associated with central clearing may reassert themselves along jurisdictional lines.

Another potential source of market fragmentation may be the extraterritorial effects of market regulation by national authorities. For example, a number of jurisdictions require transactions executed outside of their jurisdiction by entities they regulate to comply with requirements to trade on certain categories of exchange or trading platform.

In order to reduce the negative consequences of inconsistent or conflicting regulatory requirements, the G20 has agreed that jurisdictions and regulators should be able to defer to each other when it is justified by the quality of their respective regulatory and enforcement regimes, based on similar outcomes in a non-discriminatory way, paying due respect to home country regulation regimes.[13] Deference processes have proven a useful tool for a number of jurisdictions in recent years. In practice, applying such deference arrangements can present challenges both for jurisdictions considering whether to provide – as well as those seeking – deference, including in assessing when outcomes are similar. Existing arrangements for a number of global CCPs do, however, demonstrate that deference, supported by strong cooperative frameworks as outlined in international standards can be made to work effectively. Some emerging market and developing economies (EMDEs) jurisdictions have also expressed concerns that, in the absence of deference, firms in their jurisdictions can face difficulties in accessing global derivatives markets.

Most authorities with the authority to make deference assessments with regard to CCPs include financial stability or systemic risk considerations as part of their overall mandate. The methodology by which authorities may consider financial stability or systemic risk for CCP deference assessments varies. In all cases, although financial stability is or may be considered, it is not stated as an explicit criterion. For further details see Annex F.

IOSCO, in the report to the G20 of its Follow-Up Group to its 2015 Task Force on Cross-Border Regulation, finds that deference between regulators through the use of cross-border regulatory tools, particularly those identified in the 2015 Report, has increased significantly. Bilateral arrangements in the form of memoranda of understanding (MoUs) are now a common tool used by regulators, particularly with respect to information exchanges. And regulators have developed novel processes to work multilaterally to the benefit of the markets they oversee. Despite these successes, IOSCO finds that some challenges remain and strengthening cooperation between regulatory authorities could further assist in addressing effects on the financial system stemming from market fragmentation. While IOSCO recognises that deference may not be appropriate in all circumstances, its use may contribute to mitigating the risk of fragmentation for global cross-border markets. For more information about IOSCO's findings and analysis of market fragmentation, please see IOSCO's report to the G20.

[13] September 2013 St Petersburg Summit G20 Leaders agreement.

3.2 Banks' cross-border management of capital and liquidity

Following the financial crisis, the FSB coordinated the development of G20 financial reforms to address moral hazard and other risks associated with systemically important financial institutions. The disorderly failure of such institutions – given their size, complexity and systemic interconnectedness – would cause significant disruption to the wider financial system and economic activity.[14]

Post-crisis reforms have enhanced the resilience of financial institutions, including through requirements to increase the capacity of global systemically important banks (G-SIBs) to absorb loss, more intensive supervision and more robust core financial market infrastructure. They also include comprehensive reforms of resolution regimes that enable authorities to manage the failure of any type of systemic institution, such as banks, insurers and financial market infrastructures (including CCPs).

These reforms have supported financial integration by reassuring markets of the resilience of internationally active banks, and reassuring authorities that potential systemic risks from banks' cross-border activities are contained. However, some of the sources of potential fragmentation of capital and liquidity have arisen from two types of regulatory action that have been adopted to achieve the post-crisis reform objectives:

- Jurisdictions' regulations that are additional to international standards; and
- Differences in the substance and timing of jurisdictions' implementation of international standards.

3.2.1 Jurisdictions' regulations that are additional to international standards

Several jurisdictions have introduced structural requirements for banking groups. These include requirements to: (i) conduct certain financial activities through separate legal entities, e.g. separating wholesale and retail banking or certain banking and non-banking activities ('activities ring-fencing'); and (ii) conduct business in local markets through subsidiaries or to bundle certain local operations under a single entity or holding company structure ('jurisdictional ring-fencing').[15]

Jurisdictional ring-fencing may help ensure that the local operations of large international banks can be supervised and regulated in a manner similar to that applied to local banks. It is also intended to enhance the resolvability of entities belonging to financial firms incorporated in a foreign jurisdiction and safeguard the stability of the domestic financial system.

At the same time, an excessive siloing of capital and funding resources within national borders can be to the detriment of the overall resilience of financial institutions. For instance, such requirements that are not commensurate with the actual risk in those entities can constrain the degree to which financial institutions use capital and liquidity to meet shocks to their solvency and funding that occur across different jurisdictions.[16]

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[14] FSB (2010), Reducing the moral hazard risk of systemically important financial institutions, October.

[15] FSB (2014), Structural Banking Reforms: Cross-border Consistencies and Global Financial Stability Implications, October.

[16] IMF (2018), Global Financial Stability Report: A Decade After the Global Financial Crisis, October, pp. 46-51.

The FSB's international standard for resolution regimes[17] provides that authorities should evaluate whether to require certain operations to be segregated in legally and operationally independent entities or to require changes to firms' legal, financial or operational structures. Some jurisdictions have considered structural changes – e.g., the establishment of non-operational or intermediate holding companies or of 'bankruptcy remote' intra-group companies – with the intention of improving resolvability. The FSB standard also establishes a cooperation and coordination mechanism within CMGs that should help authorities consider the effects of such changes on the soundness and stability of ongoing business. Going forward, continued close cooperation will be important to address any fragmentary effects that could arise from structural requirements, including those put in place by authorities with a view to attaining both global and jurisdictional financial stability.

3.2.2 Differences in the substance and timing of jurisdictions' implementation of international standards

As in other policy areas, differences across jurisdictions in the substance and timing of implementation of internationally agreed bank reforms may in some cases affect market fragmentation. There are cases where national implementation of *Basel III* minimum standards have not been fully compliant with the Basel regulatory framework and therefore not fully consistent across member jurisdictions.[18] Market participants have reported that the potential fragmentary effects from such differences may affect in particular international activities such as trade finance and wholesale banking.

Differences in the timing of adoption of Basel III standards can also have fragmentary effects, at least temporarily. Banks in jurisdictions that have not implemented these standards in a timely and consistent manner may be exposed to greater risks as a result of having less prudent and robust regulatory requirements. Delayed implementation may have implications for a level playing field, and puts unnecessary pressure on those jurisdictions that have implemented the standards based on the agreed timelines.[19] Market participants have pointed to potential or existing divergences in the timing of national adoption and implementation of the revised market risk framework (to be implemented by 1 January 2022) and the Net Stable Funding Ratio (which was due to be implemented on 1 January 2018) as presenting potential issues in this context.

The availability of adequate loss-absorbing resources is also a necessary condition to achieve *resolvability*. The FSB's total loss absorbing capacity (TLAC) standard, which is in the process of being implemented,[20] aims to ensure that if a G-SIB fails it has sufficient loss-absorbing and recapitalisation capacity available in resolution to implement an orderly resolution that

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[17] FSB (2014), Key Attributes of Effective Resolution Regimes for Financial Institutions, October.

[18] See https://www.bis.org/bcbs/implementation/rcap_jurisdictional.htm.

[19] BCBS (2018), Implementation of Basel standards – A report to G20 Leaders on implementation of the Basel III regulatory reforms, November.

[20] The FSB will publish a report on the status of TLAC implementation in June 2019.

minimises impacts on financial stability, ensures the continuity of critical functions and avoids exposing public funds to loss.[21]

The TLAC standard and the internal TLAC guidelines[22] aim to achieve an appropriate distribution of loss-absorbing and recapitalisation capacity within a group. They provide for pre-positioning in material subsidiaries or subgroups in proportion to the size and risk of their exposures in order to strengthen their resilience in times of stress and facilitate an orderly and coordinated resolution of the group as a whole.[23]

The TLAC standard also identified the risk of 'global fragmentation of the financial system' should host authorities not have confidence that there is sufficient loss absorbing capacity in their jurisdiction at the time of resolution and thereby demand extra resources to be ring-fenced. High levels of pre-positioning in host jurisdictions that are not commensurate with actual risks could potentially result in an insufficiency of resources that remain readily available to be deployed flexibly where needed within a group in times of stress. This problem is particularly acute if there is a lack of cooperation or trust between home and host authorities and in the absence of legally enforceable mechanisms that allow for resources held elsewhere in the group to be deployed where they are needed in stress.

Several mechanisms are designed to reduce the risk that the jurisdictional implementation of the TLAC standard unintentionally results in undue fragmentation. The calibration of internal TLAC for material subsidiaries or sub-groups is to be determined for each G-SIB by the relevant host authority in consultation with the home authority.[24] The process of resolution planning within CMGs should help build confidence between home and host authorities and ensure that jurisdictions scale pre-positioning requirements at appropriate levels, within the range set out in the TLAC standard. CMGs are expected to review the calibration and composition of firm-specific TLAC and pre-positioning requirements in the FSB Resolvability Assessment Process (RAP) and assess the extent to which the requirements promote confidence amongst home and host authorities, creditors and other stakeholders in the effectiveness of the resolution plans and arrangements.

3.3 Sharing of information across borders

The importance of processing and analysing large volumes of data is increasing. Better usability of data would support authorities in effective monitoring of risk exposures and market functioning, including in monitoring cross-border aspects and global financial stability.

Significant differences in data reporting requirements and obstacles to information sharing across jurisdictions can increase the compliance cost associated with financial institutions' cross-border operations. In the extreme, they can also lead to market fragmentation if they cause

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21 FSB (2015), Total Loss-Absorbing Capacity standard for global systemically important banks, November.

22 FSB (2017), Guiding Principles on the Internal Total Loss-Absorbing Capacity of G-SIBs ('Internal TLAC'), July.

23 The TLAC standard specifies that bank sub-groups in host jurisdictions that are deemed material for the group as a whole must hold between 75% and 90% of the hypothetical external TLAC requirement that would apply if such a subgroup were self-standing for the purposes of resolution.

24 The FSB has issued high-level guiding principles to assist CMG authorities in the implementation of internal TLAC mechanisms consistent with the TLAC standard. See Guiding Principles on Internal Total-Loss-Absorbing Capacity for G-SIBs, July 2017.

firms to withdraw from certain activities. Such differences also have the potential to impair data quality, usability and ease of aggregation in ways that hinder authorities' ability to analyse global data sets. They can also combine with data localisation rules (if these are not accompanied by adequate gateways for the sharing of information among appropriate authorities) to reduce business efficiency, opportunities for risk management and supervisory effectiveness.

Some specific sources of potential fragmentation that relate to the implementation of international reforms, or have gained in importance in this context, include:

- Differences in jurisdictions' implementation of trade reporting requirements;
- Jurisdictions' legal barriers to full data reporting or sharing; and
- Differences in jurisdictions' reporting requirements relating to cyber risk and stress testing.

3.3.1 Differences in jurisdictions' implementation of trade reporting requirements

Trade reporting requirements are an important part of G20 financial reforms to OTC derivatives markets. They increase transparency, reduce market abuse and, through the aggregation of data, provide information to help address systemic risks. As in other areas of international standards, each jurisdiction's implementation will reflect national circumstances. However, in this case overlaps and inconsistencies in national implementation have meant that internationally active firms are faced with differing reporting formats and, in some cases, with requirements to report the same trade multiple times in multiple jurisdictions.

Such discrepancies can, in extremis, be fragmentary if they meaningfully increase the regulatory and compliance burdens for internationally active firms. They can also reduce potential economies of scale and therefore reduce the efficiency of cross-border activities. Differences in trade reporting requirements can also prevent the efficient aggregation of, and comparability across, national data sets, preventing authorities and SSBs from forming a holistic view of risks. The FSB published a *Feasibility Study on Approaches to Aggregate OTC Derivatives Data* in 2014 that made a number of recommendations on further work to enable effective aggregation.[25]

Work is currently taking place to achieve greater international standardisation of reporting, through the Legal Entity Identifier, Unique Product Identifier, Unique Transaction Identifier and other critical data elements. Undertaking this standardisation at an earlier stage in the process might have created the opportunity to harmonise requirements prior to their implementation by national authorities. Authorities may now find that they have to revise their requirements in order to meet the new standards, and market participants may have to adapt their reporting systems. There also remains considerable work to be done before global aggregation of data for authorities' monitoring purposes can be achieved, as laid out in the aggregation feasibility study referred to above.[26]

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[25] FSB (2014), Feasibility Study on Approaches to Aggregate OTC Derivatives Data, September.

[26] See also Appendix D, Case study on OTC derivatives trade reporting.

3.3.2 Jurisdictions' legal barriers to full data reporting or sharing

It is important for authorities to have access to the data required to carry out their mandates while maintaining appropriate regard for data privacy.

There are in some cases legal barriers to the reporting of, or authorities' access to, data across borders. In places these arise from regulation such as bank secrecy laws and blocking statutes. Data localisation requirements put in place by some jurisdictions also restrict movement of data outside of their national borders. These restrictions range from requirements for data generated inside a jurisdiction to be stored and processed by firms within that jurisdiction, to data export conditions that need to be met before data can be moved abroad.

Some of these requirements have been introduced by authorities to achieve policy objectives (e.g. data privacy) beyond those of financial regulation, and are often not set by financial regulators. They can, nonetheless, in some cases have a detrimental effect on financial stability by preventing, or making more difficult, the effective access to and aggregation of data by financial authorities. In response to one such example, the FSB has conducted an exercise among its membership to address or remove barriers to full reporting of, or authorities' access to, OTC derivatives trade repository data.[27]

International cooperation among supervisors and regulators aims at ensuring information exchange in order to allow them to carry out their mission. For example, the IOSCO Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information sets common minimum powers that securities regulators should have in order to ensure the widest assistance to their counterparts, in order to allow them to carry out their mission.[28] Members of IOSCO have also recently agreed an administrative arrangement under which personal data could continue to be transferred between certain financial supervisory authorities in the European Economic Area and those outside it, in view of the new legal requirements of the European Union (EU) General Data Protection Regulation. This is an example of a solution which increases global supervisory cooperation while maintaining appropriate regard for certain personal data privacy regulations.

Fragmentary effects can also arise from restrictions placed on the sharing of data across borders within or between financial institutions for risk management (including anti-money laundering),[29] cyber security and other regulatory purposes in a cross-border context. This can increase the cost of – and in extremis prevent – integrated operations in multiple jurisdictions, increasing the cost to end-users and preventing the benefits of cross-border diversification and risk management from being realised.

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[27] FSB (2018), Trade reporting legal barriers: follow up of 2015 peer review recommendations, November.

[28] See IOSCO, Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information (MMoU).

[29] FSB (2017), FSB action plan to assess and address the decline in correspondent banking, June.

3.3.3 Differences in jurisdictions' reporting requirements relating to cyber risk and stress testing

There are other examples of financial regulation or supervisory practice that can result in overlapping and/or potentially inconsistent reporting requirements across jurisdictions. One such area of regulation is that designed to strengthen the resilience of financial institutions to cyber risks. Recent FSB work found that a number of jurisdictions had implemented similar, but not identical, requirements in this regard, which market participants noted complicated compliance even with requirements that do not conflict.[30] Another source of duplicative reporting requirements concerns stress testing for capital purposes, where internationally active banks frequently face reporting requirements that differ across jurisdictions. As in other areas of regulations, some differences, in particular given differences in scenario designs, will be necessary in order to reflect different national circumstances. That said, greater coordination may be possible to align data reporting structures and formats.

Where overlapping and/or inconsistent requirements are not justified by different national circumstances, they may have an adverse effect on efficiency and, at the extreme, financial stability. Market participants have expressed concerns that cyber vulnerabilities in some circumstances can also arise through the multiple testing of banks' critical systems which can introduce more operational risks.

Steps have been taken by the global regulatory community to address these issues. For example, the FSB recently published a lexicon designed to provide a common terminology related to cyber security and cyber resilience in the financial sector.[31] The FSB has also begun work on the development of effective practices for cyber incident response and recovery. Going forward, authorities could consider the scope for further alignment of reporting requirements across jurisdictions where appropriate in this area.

4. Possible mechanisms and approaches to tackle market fragmentation

Since 2009, the G20 has agreed on a set of international reforms to address the fault lines exposed by the financial crisis. The FSB and SSBs have established programmes to monitor progress in implementing these policies across jurisdictions, and to evaluate their effects.[32] Cross-border cooperation and information sharing have improved. This has been aided by the ongoing establishment of supervisory colleges and CMGs, as well as bilateral arrangements particularly in relation to information exchange. Greater cooperation has fostered a better understanding of supervisory practices and outcomes and this has led to an increase in the extent to which authorities are prepared to defer to or rely on each other's supervisory or authorisation processes. Such initiatives have supported the timely and consistent implementation of a variety of international regulatory reforms.

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[30] In 2017, 25 member jurisdictions have 85 different schemes of regulation and guidance, and 35 different supervisory practices; see FSB (2017), Stocktake on cybersecurity regulatory and supervisory practices, October.

[31] FSB (2018), Cyber Lexicon, November.

[32] FSB (2017), Framework for Post-Implementation Evaluation of the Effects of the G20 Financial Regulatory Reforms, July.

Notwithstanding this progress, consideration of further strengthening of regulatory and supervisory cooperation may help address the risk of market fragmentation associated with international standards, both before and after it arises. This section explores possible mechanisms and approaches that have been and could be considered at different stages of the policy development and implementation process. These focus on potential ways to enhance the effectiveness and efficiency of cooperation – and to identify common issues and objectives – without changing existing institutional responsibilities and setups, and with the aim of enhancing the efficiency of use of resources rather than adding substantially to administrative burden. Any specific actions to take forward these approaches could only be considered after further discussion among authorities of their pros and cons. Section 5 describes the areas FSB members identified where further work may help to strengthen mechanisms and approaches to address market fragmentation.

The discussion here of potential approaches, mechanisms and next steps for further work aims to complement the description in the IOSCO Follow-Up Report on potential measures that could be explored further. The potential measures described by IOSCO include ways to foster further mutual understanding of one another's legislative frameworks, deepen existing regulatory and supervisory cooperation and consider whether there are any good or sound practices which can be identified regarding deference tools.

4.1 Development and implementation of international standards

Consider possible fragmentary effects of regulation more systematically

The FSB and other SSBs could consider the issue of market fragmentation more prominently and systematically during the standard-setting process, for instance through formal and informal consultations with public and private sector stakeholders. This might help identify and address potential fragmentary effects by providing SSBs with as much information as possible when discussing new international standards and their national implementation. Steps in this direction are already being taken by some SSBs. For example, the BCBS has agreed to give greater consideration to matters concerning jurisdictional implementation of standards so as to facilitate their timely and consistent implementation.

Provide clarification of specific technical aspects of standards where appropriate

The FSB and SSBs could consider whether there might be merit in providing clarification or guidance on specific technical aspects of standards well ahead of their targeted implementation date. This might help reduce unintended differences in the operationalisation of standards at the jurisdictional level, without constraining jurisdictions' flexibility to adapt standards to local needs. An example where action has been taken – albeit after implementation – is in trade reporting, where recent guidance on common data elements can be expected to reduce inconsistencies between reporting requirements across jurisdictions and lessen firms' compliance burden. Another example is the current technical review of the implementation of TLAC. Yet another example is the BCBS-IOSCO guidance on the implementation of margining requirements for non-centrally cleared OTC derivatives.

Consider market fragmentation as part of implementation monitoring and reform evaluation

The FSB and other SSBs have established programmes to monitor progress in implementing the G20 financial reform policies across jurisdictions, and to evaluate their effects.[33] Such initiatives have been supporting the timely and consistent implementation of the reforms. A discussion of whether non-compliance with globally agreed standards or divergences between their domestic implementation may have fragmentary effects and their potential implications for financial stability, could be integrated into these existing processes. The BCBS Regulatory Consistency Assessment Programme (RCAP) is one example of an existing initiative along these lines.[34] If a monitoring exercise or an evaluation identifies effects of fragmentation, and this has the potential to impact financial stability or market functioning, SSBs could discuss possible remedies such as technical clarifications.

4.2 Ongoing cross-border communication and information sharing

Discuss issues around fragmentation regularly in existing international fora

Cross-border cooperation and information sharing have improved with the establishment of supervisory colleges and CMGs, as well as bilateral arrangements in particular in relation to information exchange. Notwithstanding this progress, and in line with the FSB Charter,[35] a further strengthening of regulatory and supervisory cooperation and regular communication and information-sharing among relevant authorities on issues concerning market fragmentation could reinforce mutual understanding. Such communication and cooperation could help identify common problems and objectives before national or international measures are developed. It could also strengthen the basis on which to explore common approaches to home/host supervision, including greater joint and multilateral oversight of key infrastructure (e.g. CCPs).[36]

Such cross-border communication could take place through existing supervisory colleges or CMGs. Making market fragmentation a standing item on the agendas of such groups could foster a better understanding of the trade-offs between addressing market fragmentation in the context of the respective financial institution, and the need to ensure resilience via supervisory actions, taking into account financial institutions' cross-border risk profiles. Such discussions may also help to identify inconsistent supervisory expectations that lead to market fragmentation.[37]

The benefits of cross-border communication and information sharing are already being realised and are a platform upon which to build in relation to multicurrency, multinational infrastructure.

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[33] FSB (2011), A Coordination Framework for Monitoring the Implementation of Agreed G20/FSB Financial Reforms, October. FSB (2017), Framework for Post-Implementation Evaluation of the Effects of the G20 Financial Regulatory Reforms, July.

[34] BCBS, Implementation of the Basel Standards.

[35] FSB (2012), Charter of the Financial Stability Baord.

[36] One example of collective oversight is the governance arrangements for SWIFT, which consists of an oversight forum of G10 central banks.

[37] The FSB (through ReSG and its Cross-Border Crisis Management group for banks) intends to review the RAP template as necessary to evaluate whether and how authorities could consider any potential fragmentary effects as part of resolvability discussions within CMGs.

Existing initiatives include global colleges for CLS and some global CCPs; cooperation arrangements for Euroclear, Clearstream and SWIFT; and CMGs for CCPs. Such cooperation facilities promote information sharing, the coordination of supervisory activities and the collective consideration of resolution strategies in the case of CCPs.

Seek dialogue on planned measures that are likely to affect fragmentation

Early dialogue, where practicable, of planned national regulatory initiatives can facilitate more efficient addressing of issues. When national rule-making under consideration can be expected to have a significant cross-border implication, early dialogue between relevant authorities would allow such effects to be considered in the national policy process as appropriate. Whereas such a dialogue during the policy design phase can take place bilaterally, it can also happen multilaterally, for example in workshops organised by the FSB and SSBs, in meetings of FSB or SSBs working groups, or by highlighting existing public consultation periods during the rule-making process.

To help support this, and to reduce the risk of future market fragmentation, the FSB and SSBs could act as fora for discussions among members about planned national regulatory initiatives. For instance, such an initiative by the FSB could be useful when considering on a cross-sectoral basis national regulatory responses to emerging issues such as FinTech. Another example is IOSCO, which is currently considering making greater use of its Regional Committees and of its Affiliate Members Consultative Committee for members to discuss cross-border regulatory issues on a regular basis.

Use supervisory fora to align and improve data collections

Authorities could explore how supervisory fora could also be used to enhance the methods of data collections and achieve greater alignment. Templates, data models and definitions used to gather data from firms could be shared, compared and – where appropriate – aligned to enhance consistency and understanding across authorities. Firms' reporting burdens could be eased via the adoption of common reporting definitions or templates, supplemented by jurisdiction-specific definitions or templates, where necessary.

4.3 Comparability of regulatory regimes and efficiency of deference and recognition processes

Greater comparability of regulatory regimes across jurisdictions can help reduce the risk of market fragmentation, enhance the efficiency of regulation and oversight and facilitate decisions about recognition or deference.

Promote the adoption of agreements to support supervisory cooperation

Supervisory cooperation supported by the use of memoranda of understanding (MoUs) may help promote the adoption of compatible and comparable regulatory requirements. To help promote this, the relevant SSBs could, over time, consider developing a central repository of such MoUs. This could be in a vein similar to work by IOSCO and the IAIS to develop a central repository of MoUs on which regulators and supervisors could draw.

Enhance the efficiency of deference and recognition processes

Authorities, with the support of the FSB and SSBs, could enhance the efficiency of deference or recognition processes through a range of actions, for example:

- The promotion of mutual understanding of regulatory and supervisory standards and practices to form an enhanced basis for deference, cooperation and recognition decisions, such as by using regional fora for collective discussion on recognition between regulators. For example, since 2016, the IOSCO Asia-Pacific Regional Committee (APRC) members and EU authorities (the European Commission (EC) and the European Securities and Markets Authority (ESMA)) have held the EU-Asia Pacific Forum annually and discussed common issues regarding recognition.
- Discussion of the types of information that jurisdictions can usefully provide as input to outcomes-based assessment processes.
- Additional sharing of information to improve transparency and provide greater clarity on how authorities currently assess and grant deference, make equivalence decisions and decide on the comparability of outcomes between the regimes.
- Consideration of how deference processes could be supported through stronger supervisory cooperation mechanisms, such as MoUs, supervisory colleges, CMGs and other cooperation agreements, and how authorities, despite decisions about recognition and deference being intrinsically bilateral, could draw synergies from bilateral deference or recognition processes across jurisdictions. Such analysis could build on the 2015 IOSCO report on cross-border regulation.

5. Next steps

Recognising that regulatory and supervisory decision-making take place at the national (or regional) level, FSB members identified several areas where further work may help to strengthen mechanisms and approaches to address market fragmentation through more efficient and effective cooperation going forward. Initiatives would aim to build on work already underway within the FSB and SSBs. Areas for further work should include:

- *Deference processes in derivatives and securities markets*. IOSCO will consider if further work should be undertaken on deference processes, potentially including whether there are any good or sound practices that can be identified and whether more clarity on these processes is needed. CPMI and IOSCO would work jointly with respect to deference processes for financial market infrastructures if additional work in this area is warranted. To bring in considerations relevant to the FSB's mandate, these bodies would cooperate with the FSB through its Standing Committee on Supervisory and Regulatory Cooperation (SRC).
- *Jurisdictional ring-fencing and pre-positioning of financial resources by international banks*. Enhancing the understanding of approaches by supervisory and resolution authorities towards pre-positioning of capital and liquidity by international banks might support assessments of the effect pre-positioning may have on market fragmentation. The initiative would draw on work by the FSB Resolution Steering Group (ReSG) on the implementation of the TLAC standard for G-SIBs and the

experience of SRC members to cover both going and gone concern perspectives. A workshop, organised by SRC and ReSG, in the second half of 2019 would be used to identify issues that may warrant attention by authorities.

- *Regulatory and supervisory communication and information sharing.* The FSB would discuss possible enhancements in this area in a future meeting. This would include discussion of the approaches and mechanisms discussed in Section 4, to avoid future fragmentation and to ensure effective coordination with the work of SSBs. One particular focus of such discussions could be to explore whether, and if so how, the FSB could play a role in promoting greater use of common elements in supervisory data to more effectively monitor systemic risk. This could also include recommendations for the private sector and public authorities to provide early comment on proposed rules so as to avoid unintended market fragmentation.
- *Market fragmentation as part of the evaluation of reforms*. To enhance the understanding of authorities of the potential effects of post-crisis reforms, potential fragmentary effects would be incorporated in the FSB's work on evaluation of the effects of reforms. Concretely, the FSB evaluation of the effects of TBTF reforms would consider, as part of its analysis of the broader effects of those reforms, whether any of these reforms have affected market fragmentation with observed consequences for financial stability.

The FSB would review progress on the above initiatives in November 2019.

Annex A: Literature Review

This Annex reviews literature on the subject of market fragmentation. It aims to cover the breadth of issues in the report. It first outlines the literature relevant to the definition of market fragmentation. It then examines literature on the causes of market fragmentation, including that connected to investor preferences as well as financial regulation.

Throughout, it includes discussion of peer reviewed literature and staff working papers. It is not exhaustive; rather, it cites key papers, including those that contain literature reviews with more extensive references.

Definitions of market fragmentation

There is no commonly agreed definition of market fragmentation, though various definitions exist within the academic literature. Some such definitions focus on the free movement of cross-border capital flows and cross-border holdings of assets, as well as the degree to which this leads to differences in the price of economically similar assets. Other literature defines market fragmentation in terms of the degree to which market participants can offer financial services in foreign markets. These are examined in turn.

One strand of literature defines market fragmentation in terms of 'financial openness' – that is, the free movement of cross-border capital flows, which in some respects is the opposite of market fragmentation. Bush (2015) outlines an extensive literature that defines financial openness in terms of the ease of cross-border capital flows in the context of international financial integration and capital account liberalisation. Two definitions for financial openness are used in the literature. The first is *de jure* financial openness, which is defined as measuring government regulations and restrictions to capital account openness (see for example Chinn and Ito (2005) and Bush (2015)). The second is *de facto* financial openness, which is defined as the degree to which a country is integrated in international capital markets. *De facto* financial openness can be measured in many different ways, for example by the magnitude of capital flows or stocks of foreign assets and liabilities (see Kose, Prasad and Taylor (2009)). Steiner (2018) proposes an index to measure *de facto* openness based on private financial flows.

Two other strands of literature contain definitions close to the types of market fragmentation discussed in the report. The first is summarised by Ruscher and Vašíček (2016), who define market fragmentation as 'a decrease in cross-border holdings of a wide range of asset classes, resulting in a divergence of related asset prices.'[38] Other papers link the definition of financial market fragmentation to the law of one price (Japelli and Pagano (2008)). Stavarek, Repkova and Gajdosova (2012) find that, in the absence of frictions (including those brought about by market fragmentation), securities with identical cash flows should command the same price, regardless of where they are traded. A number of other studies examine deviations from the law of one price as a symptom of market fragmentation (Liu et al (2018)), as well as a lens through which to assess its causes. For example, Horny, Manganelli and Mojon (2018) examine the spread between European corporate bond yields, and find that high credit risk premia associated

[38] Ruscher and Vašíček (2016), page 33.

with the 2008-9 financial crisis were accompanied by fragmentation across some European markets.

A second strand of literature includes Baele et al (2004), who define an integrated financial market as one in which all potential market participants 'face a single set of rules when they decide to deal with those financial instruments and/or services; have equal access to the above-mentioned set of financial instruments and/or services; are treated equally when they are active in the market.'[39] They link the notion of market fragmentation to the degree to which market participants face discriminatory treatment based on their jurisdiction or their ability to access different markets.

Market fragmentation driven by regulation and its effects on financial stability

There is extensive literature on the potential fragmentary effects of regulation and their implications on financial stability. This spans issues around the clearing of OTC derivatives across borders, bank activity in core funding markets, banks' cross-border management of capital and liquidity, structural requirements for banking groups, and the proliferation of trading venues in the market for some types of financial security.

Clearing of OTC derivatives across borders

One strand of literature examines the fragmentation of central clearing and its implications for financial stability. Duffie and Zhu (2011) find that while the central clearing of derivatives can reduce counterparty risks, these benefits could be reduced if clearing services are fragmented. They show that a market in which a single central counterparty (CCP) clears both credit derivatives and interest-rate swaps gives rise to significantly less counterparty exposures compared to that in which multiple CCPs each clear a single type of derivative. Persaud (2015) finds that various types of policy measures – including the local oversight of CCPs that clear instruments denominated in local currencies and central banks' lender-of-last-resort activity – have contributed to the fragmentation of central clearing based on both geography and asset type. This work also finds that the netting benefits of central clearing are maximised by a small number of generalised clearers and undermined by having a large number of product-based clearers. Brühl (2017) finds that costs associated with policies connected to the location of central clearing of OTC derivatives decrease on the medium term due to the progressive alignment of netting efficiencies.

Krahnen and Pelizzon (2016) describe the trade-off between consolidation and competition in central clearing business. They find that the consolidation of CCPs can lead to a monopoly in central clearing and that competition between CCPs can lead them to seek to undercut each other by reducing margin requirements, in order to win greater market share. They also find that both dynamics can pose risks to financial stability. Heath, Kelly and Manning (2013) find that product-based fragmentation can erode the benefits of central clearing for investors. In a second paper, they find that creating and operating CCPs in line with international standards can limit the potential for stress to spread throughout the system (Heath, Kelly and Manning (2015)). Renault (2010) finds that in some conditions a set-up involving two CCPs can allow for greater resilience in a crisis compared to a set-up involving only one CCP.

[39] Baele et al (2004), page 6.

Bank activity in core funding markets

Aldasoro, Ehlers and Eren (2019) find that variation in the implementation of the regulatory minimum leverage ratio can contribute to market fragmentation in dollar funding markets. Banks in some jurisdictions report their leverage ratios using quarter-end balance sheets while others report daily averages. Together with Munyan (2015), they find that this can affect the cost of dollar funding around these reporting dates and fragment participation in private funding markets. Anbil and Senyuz (2018) specifically look at variation in the regional implementation of the Basel III capital reforms and how this caused European dealers to alter their balance sheets around quarter end in order to reduce the costs associated with regulation.

Banks' cross-border management of capital and liquidity

Another strand of literature looks at the benefits and risks to financial stability of cross-border banks. Claessens (2017) notes that foreign banks can enhance financial stability in the presence of stress in the host country by channelling funds to their subsidiaries. They can also be a source of contagion when there is a shock in the home country, because they can withdraw from cross-border banking and redirect funds to their home jurisdiction. Chan-Lau, Mitra and Ong (2007) note that foreign banks might import risks to their host jurisdictions when affected by an economic shock in their home jurisdiction. Buch and Goldberg (2015) also find that internal liquidity management within multinational banks can alter domestic lending and associated liquidity risks.

Other literature in this area compares the segmentation of activities of foreign versus domestic banks. Claessens and van Horen (2012) show that in advanced economies, foreign banks are often less involved in traditional forms of financial intermediation and more involved in other forms of banking.

Structural requirements for banking groups

One commonly referenced link between market fragmentation and financial stability is the phenomenon of bank ring-fencing along jurisdictional lines. Claessens (2017) examines coordination problems that can arise between home and host authorities around the resolution of international banking groups. The failure of a systemically important bank can be disorderly and have adverse cross-border effects because procedures for its resolution are national and may conflict with each other. Freixas (2003) also considers how host authorities can experience a tension between ensuring both domestic financial stability and global resilience. Erwin (2017) describes how this can result in a 'prisoner's dilemma' in which the unilateral ring-fencing of resources in one jurisdiction can reduce the probability of failure for bank subsidiaries within that jurisdiction. However, if multiple jurisdictions act in a similar way, the probability of bank failure is greater than in the case where they cooperate and allow greater fungibility of resources across borders.

Other literature examines the effects of activities ring-fencing, in which risky banking activities are separated from core banking activities, in order to protect creditors and depositors. Chow and Surti (2011) describe laws and regulations that aim to separate the activities of systemically important banks in order to lessen the impact of their failure. At the same time, separating investment from commercial banking might mean that risky activities move to other sectors, which could have implications for global financial stability.

In general, authorities face imperfect incentives and incomplete tools when dealing with global systemically important banks. Beck, Todorov and Wagner (2013) observe that during the 2008-9 financial crisis, national supervisory agencies were more willing to intervene to support local entities of international banks when their failure was likely to have adverse consequences for domestic depositors and the local economy, and the costs of intervention were more likely to be borne by foreign owners. Claessens, Herring and Schoenmaker (2010) emphasise that governments lack the tools they need to resolve banks without creating spillovers. They examine the degree to which MoUs – which were used by supervisory agencies and supervisory colleges to carry out cross-border resolution – were effective. They find that while MoUs were meant to help supervisors coordinate, they are not legally binding and so do not enforce international cooperation.

Other literature examines how the institutional structure of banks shapes their response to differences in the price of economically similar securities across different geographies. Eguren-Martin, Ossandon Busch and Reinhardt (2018) find that when faced with deviations in covered interest rate parity, UK banks respond differently depending on their degree of fragmentation. Those with more fragmented institutional structures are more likely to reduce their supply of foreign lending in the face of increases in the cost of borrowing. Banks that are part of more global structures with access to other sources of funding through foreign branches and internal capital markets tend to reduce their supply of foreign currency lending by less.

Multiple trading venues

Regulation has played a role in determining the structures through which some securities are traded. Anderson et al (2015b) find that US Regulation Alternative Trading Systems – which required venues to display quotes of their best price to all participants as soon as average daily volumes reached a specific threshold – resulted in a large increase in trading venues.

Benos, Payne and Vasios (2018) find that the introduction of centralised trading on multiple trading platforms with transparent prices was associated with a statistically and economically significant improvement in liquidity. O'Hara and Ye (2011) find that the increase in trading venues has not harmed market quality, because they find that fragmentation can lead to higher short-term volatility as well as greater market efficiency. Foucault et al (2013) find that monopolies amongst dealers can benefit end-users by reducing their search costs. A number of other authors – such as Gresse (2017) and Degryse, de Jong and van Kervel (2011) – also find that centralised trading venues can lead to greater liquidity and increase trading activity. De Frutos and Manzano (2002) draw the opposite conclusion. They find that dealers in fragmented markets can face more competition and lower inventory carrying costs, and so centralised markets might negatively affect welfare. Others, like Pagano (1989) find that fragmentation can be welfare-reducing in some cases.

There is also a literature on the impact of different trading venues on the prices of identical assets. A paper by Lescourret and Moinas (2018) finds that the interdependence of liquidity providers' inventory costs is a channel that links trading venues in fragmented markets. In this case, cross-market cost linkages enhance competition and liquidity.

Other types and causes of market fragmentation

There is an extensive literature that examines the fragmentary effects of investors' home bias; that is, the tendency of investors to hold a relatively modest proportion of foreign assets. Obstfeld and Rogoff (2001) find that home bias can be explained by the relative costs of trading experienced by investors in their home versus foreign jurisdictions. Cultural factors, including the relative ease of obtaining information on securities issued locally, are another possible explanation. Milesi-Ferretti and Tille (2011) suggest that home bias increased during the 2008-9 financial crisis. Claessens and van Horen (2014) find that – despite recent growth in international banking – banks tend to invest mainly in their own geographical regions.

Domestic policies, such as taxation and capital controls, can also contribute to market fragmentation. Kose, Prasad and Taylor (2009) find that reduced financial fragmentation enhances stability. In addition, foreign capital inflows might also put pressure on policymakers to be more disciplined in their macroeconomic and financial management.

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Annex B: Stocktake of SSBs' work on market fragmentation

In late 2018 the FSB Secretariat surveyed international bodies to take stock of how market fragmentation is defined or conceptualised in their work, the potential regulatory, supervisory or other causes of market fragmentation, what constitutes evidence of such fragmentation, the potential impacts on market efficiency and resilience and efforts to address market fragmentation before or after it arises. This stocktake aims to help identify the sources of market fragmentation and areas where there may be greater financial stability risks of fragmentation.

Definition of market fragmentation

All of the international bodies surveyed have undertaken work related to market fragmentation; a list of relevant reports or public statements can be found in Section 5. Of note, market fragmentation was a key theme of the **OECD** *Business and Finance Outlook for 2016*,[40] focusing on market fragmentation related to stock markets.[41] In this report, the OECD defines 'fragmentation' as 'the heterogeneous policies, rules, laws and industry practices that create perverse incentives and block business efficiency and productivity growth. Fragmentation manifests itself at all levels and acts as a blocking force to economic progress.'[42] The **FSB** describes the notion of fragmentation as referring to markets that break into fragments either geographically or by product type or participant. In the context of securities markets, fragmentation can be characterised by the trading or clearing of economically similar assets across multiple venues. Fragmentation of international banking might refer to pools of capital and liquidity being segregated within local markets and unable to move freely across jurisdiction.

A few other international bodies have conceptualised market fragmentation in their work:

- **BCBS**: The impact on financial markets or the competitive distortion caused by the absence of global minimum banking standards or the incomplete, delayed or inconsistent implementation of those standards. However, market fragmentation is a phenomenon that goes beyond financial regulation.
- **IAIS**: Segregation of insurance markets due to significant differences in regulatory or supervisory frameworks – including solvency, contract, consumer, corporate and licensing laws, as well as the economic and social environment (e.g. health or pension systems). Another aspect of market fragmentation relates to restrictions on buying cross-border reinsurance coverage, or restrictions on capital transfer in going concern or gone concern (in particular, issues of fungibility of capital and resolution within international groups).
- **IMF**: The differentiation and localisation of the offering and availability of like (otherwise identical) products across more than one market place.

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[40] OECD (2016). OECD Business and Finance Outlook for 2016, June.

[41] The OECD 2016 report also discusses fragmentation in clean energy investment and financing as well as fragmentation of retirement markets due to differences in life expectancy.

[42] OECD (2016), page 1.

IOSCO is also seeking to deepen its understanding of market fragmentation as it relates to securities and derivatives markets, both in terms of its impact on investor protection and market integrity, as well as financial stability. IOSCO has conducted a survey of its Board Members on market fragmentation and asked respondents for their views on a definition of market fragmentation. Respondents to IOSCO's survey also identified a number of characteristics that may allow for the identification of fragmentation. These characteristics include, amongst other things, the presence of multiple liquidity pools that are shallower in depth, a reduction in cross-border flows that would otherwise occur to meet demand, increased costs to firms in both risk and fees.

Meanwhile, the **World Bank** does not have a definition nor concept of market fragmentation but frequently refers to international financial integration in its analyses.

Potential causes and evidence of market fragmentation

The most often cited sources of market fragmentation are difference in domestic/regional and international regulatory requirements and incomplete, delayed or inconsistent implementation of international policies and standards (see Table 1). Other potential causes include rapid technological developments in finance and capital controls (**OECD**).

Differences in legal or regulatory requirements may mean that a financial product cannot be traded in all jurisdictions and/or needs to be customised. This is more acute for financial institutions that operate cross-border where the home and host authority may have different legal and regulatory requirements. These differences can fragment the market for functionally identical products and may lead to less competition and potential price differences across jurisdictions, i.e. a failure of the law of one price. It may also mean that certain types of products are not offered in some jurisdictions because customisation is too costly relative the size of the market. For example, for insurers, localisation rules restrict open reinsurance markets and investments. Other legal issues restrict market access to domestically licensed insurers and place limits on cross-border policyholder protection schemes. Meanwhile, data localisation requirements restrict movement of data outside of national borders, hindering the effectiveness of cross-border information sharing and oversight of global financial institutions.

However, not all fragmentation is unintended or undesirable. For example, the **FSB** developed a TLAC standard for G-SIBs in resolution with the aim of promoting the confidence of home and host authorities and markets 'that systemically important banks are truly no longer too–big-to-fail and are resolvable without exposing public funds to loss, they must have confidence that these firms have sufficient capacity to absorb losses, both before and during resolution.' The TLAC standard states that 'without such confidence, host authorities could demand extra resources to be ring-fenced in their own jurisdictions either ex ante or ex post in a resolution.' It also observes that adverse consequences of such actions include a 'global fragmentation of the financial system' and stresses the importance of ensuring that there be sufficient flexibility to use loss-absorbing capacity within a G-SIB where needed and that losses and recapitalisation needs can be passed to resolution entity or entities with legal certainty.

Table 1

Sources of market fragmentation

	Differences in domestic/ regional and international regulatory requirements	Incomplete, delayed or inconsistent implementation of international policies	Differences in legal frameworks, including data sharing and localisation rules	Differences in supervisory approaches	Other
BCBS	✓	✓			
CPMI	✓	✓			
FSB	✓	✓	✓	✓	
IAIS	✓		✓		Differences in economic/social environment (health or pension systems)
IOSCO	✓	✓	✓	✓	Market practices, investor preference and domestic legislation not related to financial services
IMF	✓	✓	✓	✓	
OECD	✓	✓	✓		Market-specific circumstances, such as rapid technological developments in finance
World Bank		✓			

The **BCBS** framework comprises a set of global minimum standards for the regulation and supervision of banks. This is particularly relevant for large banks with cross-border operations, since a common global standard provides certainty and clarity from jurisdiction to jurisdiction, and provides a level playing field. However, the benefits of a common global standard can be impaired and market fragmentation could result due to domestic/regional implementation of standards that fall short of the internationally-agreed version of the standards. Standards that are not implemented in a full, timely and consistent manner is potentially unsafe and unsound, undermines the level playing field, and results in global banking groups being subject to different regulatory requirements. While there is some evidence of delays and inconsistencies in the implementation of BCBS standards, the Basel Committee has not identified any empirical evidence pointing to market fragmentation.[43]

The **CPMI** has worked to assess aspects of market fragmentation in the retail and cross-border payments markets, and identified issues arising from differing domestic and international regulation of payment services.[44] The **FSB** also noted 'weak compliance with international standards, particularly those relating to Anti-Money Laundering/Countering the Financing of Terrorism (AML/CFT)'.[45] The **CPMI** also identified a risk of fragmentation from the emergence of new clearing and settlement arrangements outside correspondent banking networks.[46] It urged for consistent risk management and supervision, echoing the earlier reports.

The **OECD** 2016 report[47] provides a useful assessment of factors contributing to equity market fragmentation. It provides data on mergers and acquisitions as well as the changes in the aggregate revenue structure of major stock exchanges. It describes the fragmentation of the stock market resulting from an increase in stock exchange-like trading venues, such as alternative trading systems (ATSs) and multilateral trading facilities (MTFs), and a split between dark (non-displayed) and lit (displayed) trading. Based on firm-level data, statistics are provided for the relative distribution of stock trading across different trading venues as well as for different trading characteristics, such as order size, company focus and the total volumes of dark and lit trading. The report also provides an overview of recent regulatory initiatives aimed at maintaining market fairness and a level playing field among investors.

In addition, the **OECD** has recently published an analysis of how access to global property catastrophe reinsurance markets impacts the level of economic and insurance market disruption in the aftermath of major natural catastrophe events.[48] The report found evidence that a greater reliance on international reinsurance markets reduced the level of economic and insurance market disruption and that insurance companies in jurisdictions that imposed regulations that are additional to international standards made more limited use of international markets.

The **World Bank** Global Financial Development Report (GFDR)[49] highlights that international banking suffered a setback after the global financial crisis and analyses such trends (and showing different patterns across regions). Within government bond markets, the World Bank notes different pricing/spreads depending on the market and higher spreads overall, as well as lower liquidity and higher transaction costs.

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[43] The BCBS established its RCAP in 2012 to monitor and assess the adoption and implementation of its standards, while encouraging a predictable and transparent regulatory environment for internationally active banks. The assessments can be found at https://www.bis.org/bcbs/implementation/rcap_jurisdictional.htm.

[44] CPMI and The World Bank (2007), General principles for international remittance services, January; and CPMI and The World Bank (2016), Payment aspects of financial inclusion, April.

[45] FSB (2016), Progress report to the G20 on the FSB action plan to assess and address the decline in correspondent banking, August, page 11.

[46] CPMI (2018), Cross-border retail payments, February.

[47] OECD (2016), Chapter 4, pp 119- 140.

[48] OECD (2018), The Contribution of Reinsurance Markets to Managing Catastrophe Risks, December.

[49] World Bank (2017). Global Financial Development Report: Bankers without Borders 2017/2018, November.

Other evidence of market fragmentation includes differing data standards for trade repositories or widespread/inconsistent industry complaints about market inefficiencies (**CPMI**),[50] more segmented market liquidity across different trading platforms (**IMF**), and different pricing/spreads of government bonds depending on the market and higher spreads overall, as well as lower liquidity and higher transaction costs (**World Bank**).

Potential impacts of fragmentation on financial stability and market efficiency

With regard to fragmentation of data, the **FSB** observed in 2014 that multiple trade repositories (TRs) operate, or are undergoing approval processes to do so, in a number of different jurisdictions. The requirements for trade reporting differ across jurisdictions and TRs differ in their practices. The result is that TR data are fragmented across many locations, stored in a variety of formats, and subject to many different rules for authorities' access. The data in these TRs would need to be aggregated in various ways if authorities are to obtain a comprehensive and accurate view of the global OTC derivatives markets and to meet the original financial stability objectives of the G20 in calling for comprehensive use of TRs.[51]

From a **BCBS** perspective, potential impacts may include:

- creating an uneven level playing field among financial institutions that can result in a race to the bottom in terms of regulatory standards and/or supervisory practices, which in turn can have adverse consequences for the safety and soundness of banks and, as a result, a risk to financial stability;
- adding cost and complexity for financial institutions that operate internationally (e.g. requiring banks to tailor their IT systems and risk management for each jurisdiction in which they operate), and disincentivising participation in some national markets and business segments;
- overstating the capital and liquidity ratios reported by some banks and therefore eroding comparability between internationally active financial institutions and impairing market discipline; and
- misallocating capital and liquidity at the global level, which can amplify divergent economic and financial conditions and create adverse effects on economic development and growth.

Meanwhile, the **OECD** has considered the following:

- changes in cost of capital and pricing of risk, with effects on warehousing, credit intermediation and market making;
- changes in funding models and profiles;
- changes in business profiles, including shifts in business activities;
- changes in competition and market concentrations;

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[50] BIS (2016), Electronic trading in fixed income markets, January; BIS (2017) Foreign exchange liquidity in the Americas, March; BIS (2016), Quarterly Review: Downsized FX markets: causes and implications, December; and BIS (2018), Structural changes in banking after the crisis, January.

[51] FSB (2014), Feasibility study on approaches to aggregate OTC derivatives data, page 3.

- outcomes such as pricing processes and volatilities of financial returns as well as the pace of economic recovery after stress (natural catastrophe) events.

The **IMF** also notes that fragmentation interferes with the efficient allocation of capital, with a potential to impact availability and cost of financial services and the pricing of risk.

Other impacts include market transparency and/or substitutability (**CPMI**) and challenges with respect to cross-border resolution of G-SIBs (**FSB**) and internationally active insurance groups (IAIGs) (**IAIS**).

Efforts to address market fragmentation

In terms of harmonisation, the joint **CPMI–IOSCO** working group on the harmonisation of key OTC derivatives data elements was tasked to develop guidance regarding the definition, format, and usage of key OTC derivatives data elements that are reported to TRs and are important for the aggregation of data by authorities, including the Unique Transaction Identifier (UTI) and the Unique Product Identifier (UPI). The group has completed most of its work; CPMI–IOSCO issued technical guidance on the UTI in February 2017, on the UPI in September 2017, and on critical data elements (CDE) other than the UTI and UPI in April 2018.[52] CPMI-IOSCO also consulted on governance arrangements for CDE.[53] In early 2016, the **FSB** established a working group to develop governance arrangements for the UTI and UPI. After a consultation paper issued in April 2017, the FSB published conclusions and an implementation plan for governance arrangements for the UTI in December 2017, recommending implementation of the UTI in all FSB member jurisdictions by end-2020 and setting out governance arrangements for the UTI.[54] The FSB also published a consultation paper on aspects of UPI governance in October 2017 and a further consultation paper in April 2018.[55] The FSB expects to finalise governance arrangements and an implementation plan for the UPI in 2019 and has identified a UPI service providers.[56]

All of the international bodies surveyed have established programmes to assess implementation of international standards. These include the **CPMI**, **FSB, IAIS, IOSCO** and **OECD** peer reviews, and the **IMF-World Bank** Financial Sector Assessment Program (FSAP).[57] In particular, the **FSB** RAP aims to promote adequate and consistent reporting on the resolvability

[52] CPMI-IOSCO (2017), Harmonisation of the Unique Transaction Identifier: Technical Guidance, February; CPMI-IOSCO (2017), Harmonisation of the Unique Product Identifier: Technical Guidance, September; CPMI-IOSCO (2018), Harmonisation of the critical OTC derivatives data elements (other than UTI and UPI): Technical Guidance, April.

[53] CPMI-IOSCO (2018), Governance arrangements for critical OTC derivatives data elements (other than UTI and UPI), August.

[54] FSB (2017), Governance arrangements for the unique transaction identifier (UTI): Conclusions and implementation plan, December.

[55] FSB (2017), Governance arrangements for the unique product identifier (UPI): key criteria and functions, October; and FSB (2018), Governance arrangements for the unique product identifier (UPI): Second consultation document, April.

[56] FSB (2019), FSB designates DSB as Unique Product Identifier (UPI) Service Provider, May.

[57] Four of the IMF FSAPs undertaken since 2013 have looked at market fragmentation: the UK FSAP discussed Brexit and market fragmentation; the Austria FSAP considered the risk of market fragmentation in Central and Eastern Europe due to capital and liquidity ring-fencing, and the potential effects thereof on Austrian banks; in the Italy FSAP, fragmentation is mentioned in the context of bank funding costs; and the Euro area FSAP considered fragmentation of insurance markets and the impact of Brexit on CCP oversight and the potential for fragmented market liquidity.

of each global systemically important financial institution (G-SIFI), and help determine what should be done to address material recurring issues with respect to resolvability and over time confidence amongst home and host authorities, creditors and other stakeholders that effective resolution arrangements are in place for all G-SIBs. The aim is to both avoid the disorderly resolution of failed G-SIBs and excessive ring-fencing actions that could lead to global fragmentation. The **OECD** conducts regular peer reviews to assure compliance with its legal standards, including those on capital movements and international financial services and investment. Assessing the effects of subsidiarisation and ring-fencing of capital or liquidity in international banking groups is another potential approach to capturing fragmentation in the provision of financial services (**IMF**). Meanwhile, the **BCBS** RCAP aims to assess and promote the implementation of agreed Basel Committee reforms in a full, timely and consistent manner to help avoid the risk of fragmentation.

In addition, the **FSB** has established a framework for the post-implementation evaluation of the effects of G20 financial regulatory reforms, and has begun an evaluation of 'too-big-to-fail' policies.[58] The **BCBS** also has a work programme for evaluating post-crisis reforms and agreed to an initial set of evaluations, which comprise ongoing evaluations of: (i) individual reforms; (ii) the interactions and coherence among the capital and liquidity metrics; and (iii) the broader macroeconomic impact of reforms. These include cross-cutting evaluations such as the impact of the BCBS post-crisis reforms on the functioning of financial markets. The **BCBS** (and its subgroups) also regularly exchange views on topical regulatory, supervisory and market developments. This includes discussions on domestic/regional regulatory and supervisory measures that have the potential to result in market fragmentation.

The **IAIS** is developing ComFrame, the common framework for the supervision of IAIGs to assist supervisors in collectively addressing group-wide activities and risks, identifying and avoiding regulatory gaps and coordinating supervisory activities that may be relevant to market fragmentation under the aegis of a group-wide supervisor.[59] Where existing supervisory processes limit comparability, ComFrame is intended to foster commonality. In particular it includes a common valuation framework and a risk-based group capital standard, the Insurance Capital Standard (ICS).

IOSCO has set up a Follow-Up Group to its Cross-Border Regulation Task Force, which issued in 2015 its *Final Report on Cross-Border Regulation* (2015 Report) in securities markets.[60] The 2015 report noted that there might be instances in which conflicts or inconsistencies arose between domestic and foreign law and regulation and sought to develop a comprehensive understanding of approaches to cross-border securities regulation. It identified a series of concrete measures aimed at supporting cross-border regulation, including tools that were used by members to regulate cross-border securities market activities (national treatment, recognition and passporting). The Follow-Up Group has sought to (i) identify where harmful market fragmentation has taken place within securities and derivatives (including OTC) markets and the potential reasons for any such; and (ii) identify any new developments in cross-border regulation that may have taken place since the publication of the 2015 Report. The Group

[58] FSB (2017), Framework for Post-Implementation Evaluation of the Effects of the G20 Financial Regulatory Reforms, July.

[59] IAIS (2018), Draft overall ComFrame for public consultation, July.

[60] IOSCO (2015), Task Force on Cross Border Regulation – Final Report, September.

has considered areas where market fragmentation has taken place in securities markets and the potential reasons for any such developments.

As a first step, the group has conducted a survey of IOSCO Board members. This survey focused on eliciting responses on the existence and impact of market fragmentation on securities and derivatives (including OTC) markets, and cross-border activities with respect to each of these markets; it asked members to define market fragmentation, provide examples of where they have identified it and describe what their reaction to it has been, and how market participants have reacted to mitigate its impacts. The survey also elicited responses on the progress and experiences of the IOSCO Board members in the use of the cross-border regulatory tools identified in the 2015 Report, focusing on 'recognition' tools in particular (including any lessons learned and areas that could be improved). It will also ask members to share insights into their methodologies for producing recognition assessments, the challenges they have faced in doing so and what other practical approaches could be tried to further operationalise recognition tools on an outcomes-based basis.

IOSCO is also undertaking separate work with regard to efficient resiliency. This work has been divided into two projects, one of which will examine the practical effects of differing reporting schemes (single-sided, dual-sided, and hybrid) and investigate whether different reporting schemes capture data that is reliable and useful. The second project will investigate potential inefficiencies introduced to the market as a result of the G20 reforms on OTC derivatives, to the extent that such potential inefficiencies are related to market structure.

The **OECD's** *Codes of Liberalisation of Capital Movements and Current Invisible Operations* (the Codes), adopted in 1961,[61] are founding legal instruments of the OECD that have the objective to address market fragmentation arising from restrictions of capital flows and international trade and investment, notably in financial services. The Codes, which are open to non-OECD members, provide a multilateral policy framework that enables countries address financial stability risks, while avoiding large international spillovers, including market fragmentation. The latest update to the Codes, intended to address the increasing use of macroprudential and capital flow measures that can lead to market fragmentation, is expected to be completed in 2019.

The **OECD** also published its *Policy Framework for Effective and Efficient Financial Regulation* in 2010,[62] which offers a set of high-level principles that can be used by authorities as they develop financial sector reforms that implicitly aims to address market fragmentation arising from domestic regulations. It provides a sequencing of considerations to be taken, starting with understanding the features of the financial system, including how it should operate and how it operates in practice; articulating the policy objectives; matching policy instruments to the policy objectives; and reviewing periodically the effectiveness and efficiency of the policy and regulation in particular. It also highlights the need for enhanced international collaboration, cooperation and coordination. The OECD has discussed possible additional work on emerging trends in the structure and efficiency of financial markets, and in particular core debt and funding markets.

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[61] OECD (2018). OECD Code of Liberalisation of Capital Movements, March; OECD (2016) OECD Code of Liberalisation of Current Invisible Operations; and User's Guide (2008).

[62] OECD (2010). Policy Framework for Effective and Efficient Financial Regulation, November.

The **World Bank** is preparing its 2018 GFDR based on responses to the 2018 update of the global banking regulation and supervision survey (including insights regarding possible drivers of observed trends). The World Bank is also providing ongoing analytical and technical assistance on government bond markets, covering the following sources of market fragmentation: regulatory trends to use electronic trading platforms in parallel to OTC markets and the Volker regulations limiting proprietary trading. The impact of these two aspects, depending on the country, are: higher transaction costs and market fragmentation and lower liquidity. In some cases, this could lead to higher financial risk, lower development of government bond markets, and ultimately lower potential for capital markets deepening in a particular country.

CPMI-IOSCO have been fostering cross-border cooperation related to one of the responsibilities of the PFMIs Responsibility E, which relates to cooperation among authorities for 'promoting the safety and efficiency of FMIs'.[63] In 2015 CPMI-IOSCO published an assessment of authorities' adherence to the Responsibilities.[64] Work is ongoing to provide a 'toolkit' of how Responsibility E can be successfully implemented.

Other relevant documents related to market fragmentation

The following lists papers published by the SSBs that are not already referenced above.

BCBS

The Basel Committee's work programme (2019)

Basel III: Are we done now?, Speech by Stefan Ingves, Chairman, BCBS (2018)

Regulatory equivalence and the global regulatory system, Keynote address, William Coen, Secretary General, BCBS (2017)

Consistent regulatory implementation to keep markets integrated, Panel remarks by Jaime Caruana, General Manager, Bank for International Settlements (2013)

CPMI

Correspondent banking – final report (2016)

CPMI - IOSCO

Recovery of financial market infrastructures – Revised report (2017)

Resilience of central counterparties (CCPs): Further guidance on the PFMI – Final report (2017)

IAIS

Issues Paper on Policyholder Protection Schemes (2013)

Issues Paper on Resolution of Cross-Border Insurance Legal Entities and Groups (2011)

Insurance Capital Standard Consultation Document (2018)

[63] CPMI-IOSCO (2012). Principles for financial market infrastructures, April.

[64] CPMI-IOSCO (2015) Assessment and review of application of Responsibilities for authorities, November.

Issues Paper on Supervision of Cross-Border Operations through Branches (2013)

IMF

Global Financial Stability Report. Chapter 2: Market Liquidity – Resilient or Fleeting (2015)

Global Financial Stability Report: Is Growth at Risk? (2017)

Global Financial Stability Report: A Decade after the Global Financial Crisis: Are We Safer? (2018)

The Global Banking Network in the Aftermath of the Crisis: Is there Evidence of De-globalization? (2017). IMF Working Paper, by Eugenio Cerutti and Haonan Zhou.

The IMF's Institutional View on Capital Flows in Practice (2018)

United Kingdom: Staff Concluding Statement of the 2018 Article IV Mission (2018)

IOSCO

International Disclosure Principles for Cross-Border Offerings and Listings of Debt Securities by Foreign Issuers (2007)

Principles Regarding Cross-Border Supervisory Cooperation (2010)

Report on Cross-Border Activities of Market Intermediaries in Emerging Markets (2005)

World Bank

Balancing co-operation and competition: lessons from Latin America case studies (2008)

Making Cross-Border Banking Work for Africa (2014)

Payment Aspects of Financial Inclusion (2016)

World Bank, Bank Regulation and Supervision Survey (2018)

Annex C: Case study on trade reporting for OTC derivatives

Trade reporting for OTC derivatives provides one case study of both the potential sources of market fragmentation and coordinated action by authorities to address issues. In this case a lack of harmonisation of trade reporting requirements at the outset of the reforms, and legal barriers to full reporting of and access to trade repository (TR) data, have reduced the usefulness of TR data for systemic risk oversight in this global market and also have increased reporting costs for market participants. Coordinated international work has been undertaken or is underway, both to harmonise some aspects of trade reporting, and also to address legal barriers. Further work remains to reap the full benefit of TR data and to minimise costs to internationally active reporting entities.

Description of issue

G20 Leaders agreed at the Pittsburgh Summit in 2009, as part of a package of reforms to the OTC derivatives markets, that all OTC derivatives transactions should be reported to trade repositories (TRs). By providing authorities with access to data on trading activity in derivatives, trade reporting is a key part of efforts designed to increase transparency, improve oversight and identify and mitigate financial stability risks (institution-specific and system-wide) from these markets.[65]

There has been significant progress internationally in implementing trade reporting and most FSB member jurisdictions have comprehensive trade reporting requirements in force. The scope of trade reporting, and availability of TRs continue to increase. Authorities are using TR data for a wide range of tasks, and incorporating it in their published work.[66]

At the same time, authorities and market participants have raised the need to make further progress on standardisation of data reporting to provide better systemic risk monitoring by authorities at lower cost to financial institutions. A range of efforts are underway or planned to tackle these challenges.

Potential causes of market fragmentation linked to reporting

While the G20 commitments regarding the reporting of OTC derivative trades to a TR was a global one, the **technical details** of trade reporting requirements, including the identity and format of required reporting fields, were not harmonised ex ante.

Some of the key features of reporting regimes which differed between jurisdictions include:

- *Reporting formats:* Formats of data fields were not harmonised across jurisdictions, or across TRs, such that data reported by multiple TRs to authorities was not standardised globally, and may also not necessarily be standardised on a per-authority basis. Requirements on the timing of reporting also differ between jurisdictions.

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[65] CPMI and IOSCO (2013), Authorities' access to trade repository data, August.

[66] FSB (2018a), OTC Derivatives Markets Reforms: Thirteenth Implementation Progress Report, page 1. Data are current to end-Q3 2018.

- *Reportable fields:* The data fields required by national regimes differed, resulting in regulatory authorities basing their monitoring and analysis of the build-up of risks on data fields that may be inconsistent or incomplete.
- *Scope of reportable products:* While some jurisdictions implemented trade reporting requirements for OTC instruments only, others have gone further than the G20 commitment by including exchange-traded derivatives in their requirements as well.
- *Geographic scope of regime:* Jurisdictions have implemented differing rules relating to the connection with the jurisdiction required for a trade to be reportable.
- *Scope of reporting entities:* Some jurisdictions implemented 'single-sided reporting'[67] while others implemented dual-sided reporting; others have implemented hybrid solutions. Regulatory authorities have also set different thresholds on the size or level of activities of a firm in triggering a reporting obligation.

Furthermore, reporting entities and authorities can still face **legal barriers** to the full reporting or sharing of TR data across borders. In 2015, the FSB identified a number of legal barriers in FSB jurisdictions that prevent or hinder reporting of complete transaction information to TRs or that limit authorities' access to data held in TRs, and issued several recommendations in that regard.[68] As highlighted in the FSB's follow-up work, some legal barriers still exist, although considerable progress has been made. The FSB has identified three member jurisdictions for which further action to address or remove barriers is needed.[69]

Differences in the timing of national implementation of trade reporting regimes may be regarded as a further potential cause of market fragmentation.

Effects of fragmented trade reporting on financial stability monitoring and market efficiency

Trade reporting requirements have improved the post-trade transparency of the OTC derivatives markets to those authorities that have access to TR data, and many authorities increasingly use such data to monitor systemic risk and for a range of other purposes. Nevertheless, challenges remain to be overcome before all FSB member authorities are in a position to fully and effectively access, aggregate and analyse TR data, including the need to remove legal barriers to authorities' domestic and cross-border access to TR data as well as to harmonise TR data elements.[70] This fragmentation may therefore present a barrier to achieving some of the objectives of the reforms.[71] A lack of data harmonisation may mean that globally active firms must comply with inconsistent or duplicative reporting requirements, including reporting the same transaction multiple times to different TRs, potentially missing out on economies of scale. This fragments data and may unnecessarily add to the costs of cross-border activity. This may

[67] In other words, only one party to a trade is required to report the transaction.

[68] FSB (2015), Thematic Review on OTC Derivatives Trade Reporting: Peer Review Report.

[69] FSB (2018b), Trade reporting legal barriers: Follow-up of 2015 peer review recommendations.

[70] FSB (2017), Review of OTC derivatives market reforms: Effectiveness and broader effects of the reforms, page 4.

[71] The aims of the reforms are: improving transparency, mitigating systemic risk, and protecting against market abuse.

also impact the quality of data that is available to regulators, including creating difficulties over aggregating data and therefore getting a global picture of exposures and risks.[72]

A lack of harmonisation of reporting requirements may further give rise to fragmentation of this global market by adding complexity to any determination of equivalence between different national regimes, a factor that may have contributed to the limited number of determinations that have been made to date.[73]

Work to address market fragmentation linked to reporting issues

The FSB's 2014 aggregation feasibility study discussed key requirements and challenges involved in the aggregation of TR-held OTC derivatives data and proposed criteria for assessing different aggregation models. The study did not propose a recommendation on the choice of model, but noted 'next steps' that should be undertaken either as part of the preparatory work before any formal project is launched to implement a global aggregation mechanism, or that would need to be undertaken in order to enable effective aggregation regardless of the specific model.[74]

Acting on these recommendations, the FSB asked the CPMI and IOSCO to develop global guidance on harmonisation of data elements that are reported to trade repositories and are important to aggregation by authorities, and established a working group for governance of unique transaction and product identifiers (the UTI and UPI, respectively). Technical guidance for the harmonisation of the UTI, the UPI and other critical data elements (CDE) was finalised by CPMI and IOSCO.[75] Efforts to establish governance arrangements for these identifiers and data elements are nearing completion (expected by mid-2019).[76]

As for **legal barriers** to full reporting, and sharing, of TR data, the FSB published a follow-up report on trade reporting legal barriers in November 2018 that detailed progress by the FSB member jurisdictions in implementing the 2015 Recommendations. In broad terms, the report noted significant progress by most jurisdictions to implement the 2015 Recommendations, with only three jurisdictions identified as having outstanding issues.[77] A number of supplementary recommendations were agreed.

Building on this work, and following on from the mid-2019 completion of the FSB's work on UPI and UTI, the FSB will further consider in 2020 the need for the potential development of a global aggregation mechanism for trade reporting of OTC derivatives data, including costs and benefits as well as appropriate governance structures for such a mechanism.

Various steps have also been taken at jurisdictional and regional level to improve data reporting requirements and provide guidance on aspects of the reporting regimes.[78] Private sector

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72 See for example the academic studies cited in FSB (2017), *op. cit.,* page 29.

73 For a list of equivalence decisions consult FSB (2018a), *op. cit.*, Annex G, page 36.

74 FSB (2014), Feasibility study on approaches to aggregate OTC derivatives data.

75 FSB (2018a), OTC Derivatives Markets Reforms: Thirteenth Implementation Progress Report, pp. 7-8.

76 FSB (2018a), *op. cit.,* page 7.

77 FSB (2018b), Trade reporting legal barriers: Follow-up of 2015 peer review recommendations.

78 See for example the work cited in FSB (2017), Review of OTC derivatives market reforms: Effectiveness and broader effects of the reforms, page 30.

initiatives which aim to increase standardisation and efficiency in reporting have also been developed.

In addition to or as part of the above work, and in order to further support the potential for global aggregation, further work may be useful to standardise the scope (entity, product or geographic) of trade reporting requirements, and the data fields that national authorities require to be reported.

Annex D: Case study on ring-fencing and CMGs

The TLAC standard identified the risk of 'global fragmentation of the financial system' should host authorities demand extra resources to be ring-fenced in their own jurisdictions. Inappropriate levels of pre-positioning may lead to insufficient flexibility to allocate resources where needed within a group. This potential problem could be particularly acute if there is a lack of cooperation or trust between home/host regulators.

Institution-specific CMGs serve as a key forum for home and key host authorities to discuss the preferred resolution strategy and the appropriate distribution of loss-absorbing resources within G-SIB groups to ensure that the strategy can be implemented in an orderly manner. This case study explains how strengthened cooperation within CMGs supported by FSB standards and guidance can help address risks of market fragmentation that could arise from the implementation of local resolution policies.

Description of issue

The pre-2008 framework for the cross-border supervision and resolution of financial institutions was highly fragmented. Restructuring mechanisms, bankruptcy and resolution regimes, and other supervisory requirements varied substantially among jurisdictions, and authorities lacked a trusted set of mechanisms to navigate the differences among them. The resulting patchwork made it difficult to both oversee and, if necessary, unwind a large, complex financial firm, while continuing its most critical operations and avoiding harm to the economy. During the 2008 crisis, the consequence of this difficulty was lower investor confidence, increased volatility, and ultimately, extraordinary support for many systemically important institutions from home- and host-country governments.

G20 Leaders recognised this gap in the financial stability framework at the 2009 Pittsburgh Summit. In their communiqué, they committed to developing 'standards for large global financial firms that are commensurate with the cost of their failure', as well as 'tools and frameworks for the effective resolution of financial groups to help mitigate the disruption of financial institution failures and reduce moral hazard in the future'.[79] In the years since, many FSB member jurisdictions introduced or amended resolution processes for systemically important banks, placing a greater emphasis on planning in advance, with foreign-country authorities, for those banks' potential failure.[80] Jurisdictions also began to incorporate enhanced local rules, consistent with international standards, to support the resiliency of local operations and preserve the benefits of global banking, while acknowledging the frictions involved in operating a banking organisation that spans multiple countries.

[79] Department of the U.S. Treasury (2009), Leaders' Statement: The Pittsburgh Summit, September 24-25, 2009, September.

[80] For an overview of steps taken by FSB jurisdictions to implement resolution reforms, see FSB (2019), FSB 2018 Resolution Report: 'Keeping the Pressure Up', November.

Potential cause of market fragmentation

As part of these enhanced steps, the FSB's Total Loss-Absorbing Capacity (TLAC) Principles and Term Sheet called for G-SIBs to 'pre-position' equity funding, liquid assets and internal debt.[81] These measures offer several benefits. Pre-positioned resources help bolster the going-concern operations of global banks and improve cross-border supervision; in the event of stress, they also facilitate cooperation between home and host authorities in the resolution of a parent company and the continued operation of its subsidiaries. They help preserve a level playing-field between foreign and domestic banks, consistent with the principle of national treatment, and they minimise the amount of last-minute coordination necessary in event of a crisis, reducing the risk that regulators' response will be 'ad hoc, severely limited by time constraints, and…involve a significant amount of public support'.[82] They foster trust between home and host authorities, by signalling the intention of each to abide by existing supervisory programmes and resolution plans. They decrease the likelihood of a panic occurring, by giving reassurance that the local operations of a global bank are on sound footing.

At the same time, an excessive siloing of capital and funding resources within national borders that is not calibrated to the actual risk in those entities can constrain the degree to which financial institutions use capital and liquidity to meet shocks to their solvency and funding that occur across different jurisdictions. This can be to the detriment of their overall resilience.[83]

The TLAC standard and the internal TLAC guidelines[84] aim to promote an appropriate distribution of loss-absorbing and recapitalisation capacity within a group and provide for the pre-positioning of resources as internal TLAC within a certain range.[85] At the same time, the standard also stresses the importance of ensuring that there be sufficient flexibility to use loss-absorbing capacity within a G-SIB where needed. Acknowledging national host jurisdictions' mandates to protect domestic stakeholders in this way, while recognising the importance of flexibility, contributes to global stability.[86]

Other important elements of cross-border resolution planning include continued access to liquidity and operational continuity to maintain the continuity of critical business lines. In a world with substantial cross-border financial activity, home- and host-jurisdiction authorities must cooperate to gain a complete view of an institution's risks – and promote a coordinated approach to mitigating them (such as through readily available surplus TLAC resources) – and resolvability. Without robust processes to inform and support going- and gone-concern oversight, authorities could impose divergent or misaligned requirements, fail to preserve cross-

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81 FSB (2015), Total Loss-Absorbing Capacity (TLAC) Principles and Term Sheet, November.

82 BCBS (2010), Report and recommendations of the Cross-border Bank Resolution Group, March.

83 See Vice Chairman for Supervision Randal K. Quarles, Trust Everyone--But Brand Your Cattle: Finding the Right Balance in Cross-Border Supervision, remarks at 'Ring-Fencing the Global Banking System: The Shift towards Financial Regulatory Protectionism' Symposium sponsored by Harvard Law School Program on International Financial Systems, Cambridge, MA (May 16, 2018).

84 FSB (2017), Guiding Principles on the Internal Total Loss-Absorbing Capacity of G-SIBs ('Internal TLAC'), July.

85 The TLAC standard specifies that bank sub-groups in host jurisdictions that are deemed material for the group as a whole must hold between 75% and 90% of the hypothetical external TLAC requirement that would apply if such a subgroup were self-standing for the purposes of resolution.

86 Quarles (2018).

border operations, or impair access to overseas markets, which could exacerbate fragmentation.[87] For example, inappropriately high levels of pre-positioning may lead to insufficient flexibility to allocate resources where needed within a group, including down-streaming to and among foreign subsidiaries in stress.

Potential risk to financial stability or market efficiency

The 2008 financial crisis demonstrated the coordination challenges and financial stability risks associated with global financial institutions whose capital and liquidity are not positioned congruently with their activities. It also demonstrated the widespread market strain and extensive losses that a lack of cross-border cooperation around resolution can create. Well-positioned resources, a credible cross-border resolution regime and ex ante work to ensure the resolution regime can be operationalised can help prevent such a crisis from emerging. In the absence of cooperation, however, such a regime cannot function credibly when a crisis emerges. Even though resources are well-positioned ex ante, they might turn out to be inefficiently positioned ex post (i.e. after a crisis breaks out), generating capital or liquidity surpluses and shortages in different parts of a cross-border financial group. Uneven distribution of resources has the potential to give rise to market fragmentation. Risks could arise across borders, yet remain undiscovered and unaddressed.

Effort to address market fragmentation

Recognising this danger, authorities took a range of steps to encourage greater coordination around both going- and gone-concern requirements. For day-to-day supervision, these included improved bilateral supervisory coordination and the establishment of supervisory colleges. For resolution, they included CMGs, institution-specific cross-border cooperation agreements, and resolvability assessments.[88] While some steps have been bilateral, the FSB and Basel Committee have coordinated or hosted many others, helping to develop common standards, monitor progress towards creating such regimes, and map out those regimes' application to a systemically important bank during a financial crisis.[89]

CMGs show the particular value of enhanced cooperation to reduce the risk of fragmentation that would be harmful to financial stability. The FSB's Key Attributes for Effective Resolution Regimes state that home and key authorities of all G-SIFIs should maintain CMGs with the objective of enhancing preparedness for, and facilitating the management and resolution of, a cross-border financial crisis affecting the firm.

CMGs allow relevant authorities to meet on a regular basis to discuss firms' progress on delivering resolvability, underpinned by the FSB RAP. Within the CMG, authorities discuss firms' progress, exchanging information about work programmes and priorities guided by the FSB RAP template. The firm is invited to attend for part of these discussions. In some

[87] Quarles (2018).

[88] FSB (2011), Key Attributes of Effective Resolution Regimes for Financial Institutions, October; Federal Deposit Insurance Corporation (2010); FDIC and Bank of England Announce Enhanced Cooperation in Resolving Troubled Cross-border Financial Institutions, news release, January.

[89] FSB (2018), FSB publishes guidance on bail-in execution and resolution funding to promote G-SIB resolvability, news release, June; FSB (2017), Implementation and Effects of the G20 Financial Regulatory Reforms: 3rd Annual Report, July.

jurisdictions, a letter is sent to the firm by the home authority reflecting the discussion among CMG members.

This process allows authorities to gain an understanding of firm resolvability through the lens of common international standards developed through the FSB, facilitating a more effective approach to ex ante barrier removal. Discussions within CMGs have included a shared recognition that optimal resource positioning during resolution planning does not rule out, per se, the risk of sub-optimal cross-border distribution of capital and liquidity during resolution management. Such a shared recognition and a clear commitment to address uneven ex post allocation of resources could provide stakeholders with enhanced confidence that threats to market fragmentation would be kept as contained as possible.

For example, CMG discussions often cover authorities' approaches to implementing international standards such as TLAC or operational continuity in resolution. CMGs can help jurisdictions to increase transparency and identify divergence in expectations. This helps identify possible sources of fragmentation at the firm and/or sectoral level.

Finally, CMGs provide a useful forum for authorities to build relationships in peacetime, strengthening lines of communication ex ante, helping authorities to take swift action in crisis. Alongside the trust-building mechanisms outlined above, CMGs therefore facilitate the necessary cooperation and coordination that an orderly cross-border resolution requires.

CMGs also offer a locus for further cooperation in mitigating market fragmentation risks – for example, discussion and consultation about the distribution of capital resources (iTLAC scaling) within G-SIB groups, or ex ante actions that may be taken by each authority in resolution. More detailed and granular discussions on ex ante crisis management issues could help to build confidence in crisis management arrangements and reduce the risk of fragmentation on an institution-specific level.

Together, efforts such as these have bolstered the credibility of host-jurisdiction regulatory regimes while minimising their costs, letting authorities focus on local resiliency and prepare for catastrophe, while reducing the likelihood it will occur. They also demonstrate the valuable role the FSB can play in facilitating transparent coordination efforts among subsets of supervisory and resolution authorities, highlighting specific technical challenges and offering a forum or process that jurisdictions can use to resolve them.

Annex E: Informal summary of the workshop

As a means of engagement with external stakeholders, the FSB, in cooperation with IOSCO, held a workshop on 28 January 2019 on market fragmentation. The workshop explored what market fragmentation is, under what conditions it can emerge and what its potential impacts are. It also aimed to identify tools that national authorities and standard setters have used to address the risk of market fragmentation arising from regulatory or other causes, in particular when such fragmentation could adversely affect financial stability.

Thirty-four participants from financial institutions, industry associations, consulting firms, think tanks and academia as well as 50 participants from the public sector attended the workshop. Each session included short presentations followed by open discussion. The following day, the public sector participants discussed the main takeaways from the workshop, which informed the development of the FSB report on the impacts of market fragmentation on financial stability and market efficiency.

This document provides a summary of the key themes raised by external stakeholders ('participants') in the workshop, with particular focus on discussion of fragmentation that has implications for financial stability and market efficiency. It does not represent the views of FSB member authorities or reflect consensus views expressed by external stakeholders at the workshop.

Market fragmentation and financial stability

To frame the discussion for the day, the workshop began with presentations by the public sector on the financial stability implications of market fragmentation.

The presenters noted that the G20 financial reforms have strengthened financial stability and that there is a need for authorities to tailor national regulations to national circumstances. However, some market participants noted that inconsistencies in the timing and substance of national implementation of internationally agreed reforms, incompatible home and host supervisory and regulatory requirements, and the adoption of national reforms that have extraterritorial effects and impacts on market participants can cause fragmentation both within jurisdictions but even more so across borders.

A few participants noted that some market fragmentation is a necessary by-product of measures intended to strengthen financial stability, but unintended and undesirable instances of fragmentation that reduce financial stability or efficiency, without countervailing benefits, need to be addressed. Some fragmentation arises from the presence of multiple trading venues and is not necessarily of concern if they do not lead to significant price differences across venues.

Market participants discussed the trade-offs between the cost and benefits of this type of fragmentation for financial stability. For example, securities markets that are fragmented across multiple trading venues promote more competition for order flow and greater incentives to innovate, but can lead to greater search cost, less liquidity/price transparency and more execution uncertainty, depending on the regulatory framework. In contrast, concentrated markets provide greater depth, higher certainty of order execution and greater price transparency but can lead to monopolistic behaviour, higher trading cost and stifle innovation.

There is also fragmentation in international banking, which can lead to a cost of holding higher capital and liquidity at subsidiaries, but the more segmented market at times has some benefits both to individual banks and to overall financial stability.

Market fragmentation in securities and derivatives markets

The discussion on securities and derivatives markets largely focused on the potential for fragmentation in central clearing arising due to rules that require certain types of transactions to be cleared nationally. Participants also discussed fragmentation connected with data standards, cyber security and crypto-assets.

Central clearing

Market participants discussed the frictions that arise from policies that require certain types of transactions, typically those denominated in that jurisdiction's currency, to be centrally cleared at local, or locally supervised, CCPs. This may result in CCPs in more than one jurisdiction being used to clear the same instruments, and segmentation if local market participants are obliged to clear locally and foreign participants prefer to clear transactions among themselves at foreign CCPs. This setup reduces netting opportunities across portfolios and increases costs by leading to higher total amounts of initial margin and default fund contributions, higher capital charges and greater counterparty risk.[90] If the local participants in CCPs have highly directional portfolios this can exacerbate the effect. One workshop participant estimated that aggregate initial margin, capital and counterparty risk is around 5-20% higher than if the swaps were cleared in the same CCP.

Another market participant noted that the client clearing market has become highly concentrated; higher clearing costs have led to a decline in the number of CFTC-registered Futures Commission Merchants, from 90 ten years ago to 54 today, of which 17 are clearing derivatives trades and five account for 80% of the cleared volume. A few participants noted that greater concentration in clearing houses should be supported by strong regulation and supervision. Fewer clearing members in CCPs mean less scope to mutualise risk and end-users have less access to central clearing, which increases hedging costs and reduces returns to investors. One market participant said that clients in emerging markets cannot directly access CCPs in advanced economies and are effectively paying three times the amount of a global clearing member for central clearing services.

Some market participants noted the growing use of dark pools or other alternative order mechanisms that may benefit individual market participants by reducing market impact of their trading that do not contribute to price discovery and therefore reduce market liquidity. One participant estimated that more than 50% of swaps or US Treasuries are traded in dark pools or other venues.

A few other market participants said that the various liquidity requirements for banks were fragmenting liquidity by reducing the velocity of collateral. Regulations based on end-period balance sheets instead of period averages lead to year-end spikes in repo rates. They cautioned about collateral shortages in periods of stress.

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[90] The Federal Reserve Bank of New York has coordinated initiatives to net swaps in recent years. One participant estimated that the ability for clearing members to net positions resulted in over a $1 quadrillion reduction of redundant swaps.

Another issue highlighted by some participants was concentration in fragmented markets, which reduce the portability of derivatives contracts should a clearing member fail; even if contracts are exactly the same, a few market participants noted that assets may not be portable in a reasonable amount of time due to concentration among clearing members. One participant noted that the lack of a leverage ratio offset for customer margin increases stress on a CCP's default management given that bank clearing members must come up rapidly with regulatory capital to port those positions onto their own balance sheets.

Data standards

Participants discussed the need to make further progress on standardisation of data reporting to provide better systemic risk monitoring by authorities at lower cost to financial institutions. The issue arises due to different reporting standards and requirements by authorities across jurisdictions (and also within the same jurisdiction). The issue is particularly relevant for OTC derivatives where transaction-level reporting is required and individual transactions often need to be reported several times. While progress in harmonising standards for data fields has been made by standard-setters (e.g. Legal Entity Identifier, Unique Product Identifier, Unique Trade Identifier, Common Data Elements), more work is needed to implement the standards to obtain comparability of information to allow for data aggregation and to streamline reporting processes. If harmonised reporting standards are achieved, then the use of artificial intelligence and big data become relevant and usable for the identification of risks.

Cyber security

Market participants highlighted cyber security as an area where approaches, subject to national sensitivities, should not be fragmented. They said that all stakeholders want the same outcomes, but complexity arising from different jurisdictions' regulations and supervisory expectations lead to challenges and duplication from similar yet slightly different requirements. They also noted the importance of basic minimum standards of cyber hygiene and the ability to detect and recover from a cyber incident. The FSB stocktake on cybersecurity regulation and supervisory practices reported that there were 56 schemes of regulations and guidance reported as targeted to cybersecurity and/or IT risk across the 25 FSB member jurisdictions.[91] One participant estimated that, collectively, financial market infrastructures and chief information officers are spending 30-40% of their time on compliance with different rules rather than 'fighting the bad guys'.

Crypto-assets

One market participant said that crypto-assets are global in nature, but their regulation varies around the globe. They should be subject to the same degree of rigour for AML/CFT purposes as traditional assets. A consistent regulatory approach across jurisdictions would help address such issues, including a common definition of crypto-assets.

Market fragmentation in international banking

Participants mentioned a range of policies that can be a source of market fragmentation. These include outright prohibitions of, for example, movement of deposits across jurisdictions;

[91] FSB (2017), Summary Report on Financial Sector Cybersecurity Regulations Guidance and Supervisory Practices, October.

differing national rules; requirements that favour domestic activity (e.g. creating a home bias for lending); and extraterritoriality and its effects. Most of the discussion centred on market fragmentation arising from resolution and data localisation policies as well as from different supervisory methods and approaches.

Resolution policies

Market participants discussed the potential fragmentary effects arising from resolution policies, that these could have either positive or negative implications, and how any negative effects could be addressed. They recalled Mervyn King's words that 'banks are global in life and national in death'.

Participants discussed whether ring-fencing and other measures, in addition to making cross-border banking costlier, might also actually make the system more fragile and lead to less efficient allocation of financial resources. They noted that the resolution policies developed at the international level are aimed at providing authorities with the powers and tools to resolve a global firm as a whole (e.g. through a single point of entry strategy). However, the implementation of those policies has given rise to the temptation to adopt ring-fencing strategies in order to strengthen the jurisdictional control in a crisis. The domestic requirements that were adopted in some jurisdictions (e.g. subsidiarisation requirements, requirements to establish intermediate holding companies, high-levels of pre-positioning requirements) tend to favour domestic activities and trap resources at local levels. Participants discussed whether those measures would make cross-border banking merely costlier or whether they would also actually make the system more fragile. They also discussed whether those measures were intended as interim measures until an effective cross-border resolution framework had been put fully in place, or whether they meant that banks should adopt a new model of subsidiarisation with a lower proportion of cross-border activities.

Participants also discussed possible means to help avoid negative effects from fragmentation arising from resolution policies. They stressed the need for strengthening mutual trust amongst authorities so that home and host authorities have confidence that a coordinated global resolution strategy would be implemented and that underlying resolution actions (e.g. bail-in of TLAC resources, the downstreaming of resources from the parent to a subsidiary) would be enforceable in a cross-border context. They called for joint work on resolution planning and resolvability in CMGs to be further strengthened to achieve this.

Data localisation

Participants raised concerns that data privacy initiatives are presenting obstacles to cross-border cooperation and information sharing. In particular, market participants noted that requirements that data be stored within a given jurisdiction (e.g. data localisation policies) are forcing financial institutions to locate all or part of their data, information or operations within national borders. For cross-border firms, these restrictions limit internal sharing of information for risk management, cyber security and AML, as well as increasing costs and reducing their ability to serve clients.

Market participants recognise that data localisation policies are an issue that involves authorities that extend beyond the financial sector. One participant noted that the importance of data restrictions will grow along with the growing use of BigTech, RegTech and SupTech. Another participant urged financial authorities to find ways to share information as necessary, including cross-border with MoUs, while continuing to respect data privacy laws.

Existing supervisory and regulatory tools

Participants discussed IOSCO's 2015 Cross-Border Regulatory Toolkit for the securities and derivatives markets and its current work on market fragmentation, which includes a follow-up exercise to the 2015 report. Some participants saw recognition of foreign regulatory regimes as the most pragmatic tool but noted that existing outcomes-based assessments for recognition purposes were complicated and lengthy. For example, one market participant said the European Union is working on equivalence assessments for 35 jurisdictions under 43 different regulations. Another market participant recommended that policymakers should implement a risk-based framework for the evaluation and recognition of the comparability of derivatives regulatory regimes, and that international SSBs should establish a process that would enable national regulators to implement equivalency and substituted compliance determinations in a predictable, consistent and timely manner. A few participants discussed the challenges with outcomes-based assessments due to a lack of granularity in the international standards and a lack of clarity over the outcome against which the 'outcomes-based' approach is measured; it was suggested that this could be addressed by further clarifying the intended outcomes and objectives of international policies standards that are developed.

In regard to international banking, one market participant questioned the price of fragmentation, noting that banks are less efficient than they should be as they cannot manage capital and liquidity globally; have to apply solo regulation regimes in some jurisdictions; are less efficient in terms of risk management and more risky due to smaller pools of liquidity; and less commercial as liquidity constraints increase costs and hinder the ability to service clients globally (e.g. correspondent banking). Some of these constraints can be addressed by using existing tools to enhance supervisory cooperation, such as MoUs, supervisory colleges and CMGs. Supervisory colleges, for instance, are a useful fora for authorities but there seems to be a lack of strong alignment on what the target end state should be. Another market participant noted that more regulatory coordination is need, noting that AML regulations sometimes conflict with data protection rules.

Participants also discussed the international rulemaking process. One market participant said it would be helpful for the SSBs to be more transparent about their agenda and the process by which the market can interact. Another participant suggested the SSBs could follow a similar 'notice and comment' approach that some national jurisdictions follow to solicit input from all the right stakeholders. Some market participants said that the quantitative impact studies (QIS) of international policies are often conducted too late, i.e. after the policies are agreed. It was suggested that international bodies could conduct QIS assessments earlier in the policy development process, and, within those impact assessments, consider fragmentation issues.

Potential mechanisms to address market fragmentation

Participants discussed ways to improve the process for developing international policies. These included promoting more granular standards to make divergence in implementation more easily identifiable; analysing ex ante the financial stability impact of market fragmentation during the standard-setting or rulemaking process; examining ex post any potential fragmentary effects of the implementation of international reforms through the FSB evaluation framework and BCBS RCAP; and increasing public consultation and engagement on new policies. Some market participants also suggested that the supervisory architecture for global operations be reviewed, particularly in the areas of payments and new technology.

Market participants also discussed how national authorities could enhance the effectiveness of supervisory and regulatory cooperation to promote consistency of implementation of international standards. For instance, some participants suggested that national authorities could find mechanisms to build trust between authorities (e.g. secondment programmes, supervisory colleges, CMGs); strengthen multilateral cooperation, including through MMoUs and implementing the IOSCO recommendation from its 2015 Report for an MMoU repository; and sequence the development of national policies so that they follow international standard-setting. They noted that such process enhancements could help to address gaps/conflicts between prudential and market regulation, support outcomes-based assessments and facilitate harmonisation of data reporting templates to more effectively monitor systemic risk. Some market participants suggested that the FSB use its convening power to establish a public-private sector group, similar to the Enhanced Disclosure Task Force, to propose more harmonised data formats.

In regard to the securities and derivatives markets, one market participant said that the 'original sin' of derivatives reform was the failure to designate a global standard-setter by the G20, noting that since that 'original sin' more than 10 years ago, there has been a protracted game of catch-up. The market participant said that this increment nature of G20 processes make evaluations of their effectiveness difficult. This market participant also noted that the systemic risk concentration in CCPs requires a radical solution, such as supranational oversight. Some market participants suggested that the preferable setup would be one large CCP (e.g. a natural monopoly utility) per asset class with high economies of scale and subject to strong regulation and supervision. This would enable a large and diverse set of clearing members to mutualise risk. Another market participant suggested that more focus should be on getting the CCPs to work together more efficiently, and consider how to best organise the CCPs (e.g. by product, by currency). Some market participants also suggested developing a framework for outcomes-based assessments to apply recognition/deference and to increase the transparency of jurisdictional equivalence assessments, drawing on international assessments, peer reviews, and the IMF-World Bank FSAP.

One market participant said that asset management is very fragmented, reflecting a very diverse client base which is generally unlevered. This is positive for financial stability but there are challenges in terms of risk management as a one-size-fits-all approach is not suitable. Financial stability is not seen as an end in itself but gives confidence to end-users to commit capital to markets. There is a need to consider at the early stages of policy development the implications for end-users, including meaningful disclosure. For example, this market participant noted that there are insufficient disclosures on CCPs and too many standards for environmental, social and governance (ESG) criteria. Stock exchanges, for example, could start requirement ESG disclosures then perhaps the accounting standard-setters would follow.

Annex F: Deference with regard to CCPs[92]

Given the importance of central clearing in limiting systemic risk, the FSB OTC Derivatives Working Group (ODWG) conducted a stocktake on the FSB jurisdictions' deference practices and considerations with respect to CCPs from a financial stability perspective. The stocktake follows existing work done by the ODWG to monitor the existence of legal powers and decisions made, to exercise deference across the different OTC derivatives market reform areas.[93]

The stocktake indicates that seven jurisdictions have made deference assessments with regard to CCPs, while five others have the authority to make deference assessments but have not yet done so. Most authorities with the authority to make deference assessments with regard to CCPs include financial stability or systemic risk considerations as part of their overall mandate.[94] The authorities concerned in individual jurisdictions could be either market regulators or, less frequently, central banks or finance ministries.

The methodology by which authorities may consider financial stability or systemic risk for CCP deference assessments varies. In all cases, although financial stability is or may be considered, it is not stated as an explicit criterion. One jurisdiction noted that recent amendments to its regulations incorporate, in the CCP recognition process, financial stability considerations relating directly to CCPs.

For some jurisdictions, assessing the consistency with the Principles for Financial Market Infrastructures (PFMI) of home jurisdictions' CCP supervision and regulation is a means of taking account of financial stability. Moreover, almost all jurisdictions with these deference frameworks report some form of regulatory or supervisory safeguards (e.g. entering into a cooperation arrangement) as a condition to provide deference. In the case of CCPs that are systemically important, authorities in a few jurisdictions could impose requirements (in at least one case, in consultation with the home authority) beyond those that are applied to non-systemically important CCPs, in order to provide additional safeguards where appropriate.

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[92] The stocktake conducted by ODWG focused solely on financial stability or systemic risk considerations in relation to deference arrangements. It was not part of the scope of the stocktake to address to what extent market fragmentation considerations affected deference arrangements, nor did the stocktake address how authorities have assessed any possible tension between financial stability or systemic risk considerations and market fragmentation considerations when entering into deference arrangements.

[93] For example, see the deference legal powers and decisions listed in Appendix G, Tables V and W of FSB (2018), OTC Derivatives Markets Reforms: Thirteenth Implementation Progress Report.

[94] For this purpose the EU is counted as a single jurisdiction. The EU includes six FSB member countries (DE, ES, FR, IT, NL and UK), of which the UK is scheduled to leave the EU by October 2019. The UK also provided information on its post-Brexit arrangements, and was also counted as a separate jurisdiction for this purpose.