

Market resilience: Discussion paper

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1. Executive summary

1. Events in recent years have highlighted the range of risks faced by modern economies, and led to concerns in many countries about the ability of systems and institutions to prevent, mitigate, adapt and recover from disruptive events. An important element of these concerns, and one that is particularly relevant to competition authorities like the CMA, is market resilience – that is, the extent to which markets are vulnerable to supply disruption in the face of shocks or rapid structural change.¹ This paper considers the drivers of market resilience, and the role of competition authorities and wider government in ensuring that markets – particularly for essential goods and services – can meet the needs of people, businesses and the wider economy in both stable and unstable times.
2. All markets are subject to shocks and changes that affect the ability or willingness of suppliers to meet demand; but some are more vulnerable than others to harmful supply disruption. The March 2022 Working Paper, [Resilience and competition policy](#), identified a number of market features that contributed to fragility, and aggravated or prolonged the harm caused by disruption to supply. This paper builds on that work.
3. [Section 2](#) sets out an analytical framework intended to help identify and assess the market features associated with low levels of resilience. This market resilience assessment framework distinguishes between two sets of features:
 - Causes of fragility: that is, features that can raise the risk of supply disruption, irrespective of the harm that disruption may cause. The key causes of fragility identified in the framework are lack of supply diversity – that is, dependence on a small number of suppliers, whether domestically or overseas; and financial risk arising from suppliers being highly leveraged and/or unprofitable.
 - Amplifiers of harm: that is that is, features that can aggravate or prolong the harm caused by supply disruption, and turn it into a potential crisis. The three key amplifiers of harm identified in the framework are the criticality of the good or service in question; the extent of barriers to entry and expansion; and the presence of vulnerable consumers.

¹ A market may lack resilience and yet not actually experience supply disruption because policy interventions – for example, bailouts or regulatory forbearance – enable supply to continue. Often these “crisis interventions” do not address (and may even exacerbate) underlying fragilities.

4. These features can reinforce one another, and in many instances of harmful supply disruption, a combination of them are present. The seven case studies in [Section 3](#) illustrate how the features in the framework link through to real-world resilience problems across a range of sectors, and how the action of competition authorities, and wider government policy, has contributed – both positively and negatively – to market resilience.
5. [Section 4](#) considers how the CMA’s work can influence the features set out in the framework, and thereby support market resilience. In general, the CMA’s powers and functions are likely to be more effective in preventing markets developing in ways that may undermine resilience, than they are in addressing pre-existing resilience problems. In particular:
 - the CMA’s merger control can prevent a loss of supply diversity, thereby preventing (in certain circumstances) the fragility that arises from dependence on a small number of firms or production facilities;
 - the CMA’s enforcement of competition law can help to deter and stop firms from exploiting circumstances where supply is disrupted (for example, using crises as cover for collusion to sustain high prices), or by behaving in certain ways that can harm resilience (for example, by locking customers into exclusivity agreements, thereby reducing their ability to seek alternative sources for key inputs);
 - following market studies and investigations, the CMA can recommend or (in the case of market investigations) implement steps both to support supply diversity, and to address other market features associated with resilience, to the extent that these can be shown to harm consumers and/or competition.
6. However, action by the CMA is likely to provide only a partial response to most market resilience issues. This is principally because its tools can only be used in certain circumstances, and once certain legal tests have been met. Other policy levers – including wider competition policy, industrial strategy, regulation and trade policy – also play an important role in supporting market resilience and addressing supply disruption. The CMA has a function to provide advice to government and public authorities, which it uses to assist in the development of pro-competitive, pro-consumer policy. Accordingly, [Section 5](#) reviews some of the wider policy options to prevent and respond to market fragility, and considers their implications for competition:
 - Onshoring, and other initiatives to support domestic production, may in certain circumstances help to reduce dependence on unreliable sources

of overseas supply. But selective state support to promote “national champions” risks harming resilience, competition and productivity.

- Trade openness generally improves supply diversity and thereby promotes market resilience.
 - In markets where government is the dominant buyer, procurement practices can strongly influence market resilience. Public procurers should maintain strong understanding of the markets from which they source essential goods and services, and adopt commercial strategies that promote market health and resilience over the short, medium and long term.
 - Although statutory exemptions from competition law may be necessary in certain circumstances to support supply continuity for essential goods and services, such measures can carry risks if they are not carefully scoped and monitored. Governments may also consider relaxation of the merger regime at times of crisis to where it considers certain transactions could support market stability.² However, where governments wish to protect firms against failure for public policy reasons, a well-designed package of temporary financial assistance is likely to be preferable (from both a resilience and competition perspective) to permitting an anti-competitive merger.
 - Regulatory intervention is widely used in a range of markets to support resilience and can in principle affect all the market features in the framework. For some critical goods and services, market monitoring and oversight regimes, backed by information-gathering powers, can help policymakers identify and mitigate emerging resilience problems (for example, the risk of insolvency or strategic exit of key suppliers from a market).³
7. Across all its work, and in its prioritisation decisions, the CMA will be alert to strategically important markets where competition may not be functioning properly, putting the supply of essential goods and services at risk of disruption. In particular, it will use the framework in this paper:
- as part of the ongoing development of its horizon-scanning capabilities, to help identify markets that may be vulnerable to harmful supply disruption;

² For example, the 2008 merger of Lloyds TSB Group and HBOS plc (see e.g. [Decision](#) by the Secretary of State for Business, 31 October 2008)

³ Regimes of this nature were recommended as part of the CMA’s audit and children’s social care market studies.

- to inform the CMA's prioritisation decisions, and to assist internal consideration of how resilience risks might bear on its tools and functions, reflecting its medium-term priority to promote resilience through competition;⁴
- to help determine what action by the CMA or others may help to improve resilience in fragile markets;
- to assist government, where appropriate, in the design and implementation of measures to prevent and remedy market fragility.

2. The market resilience assessment framework

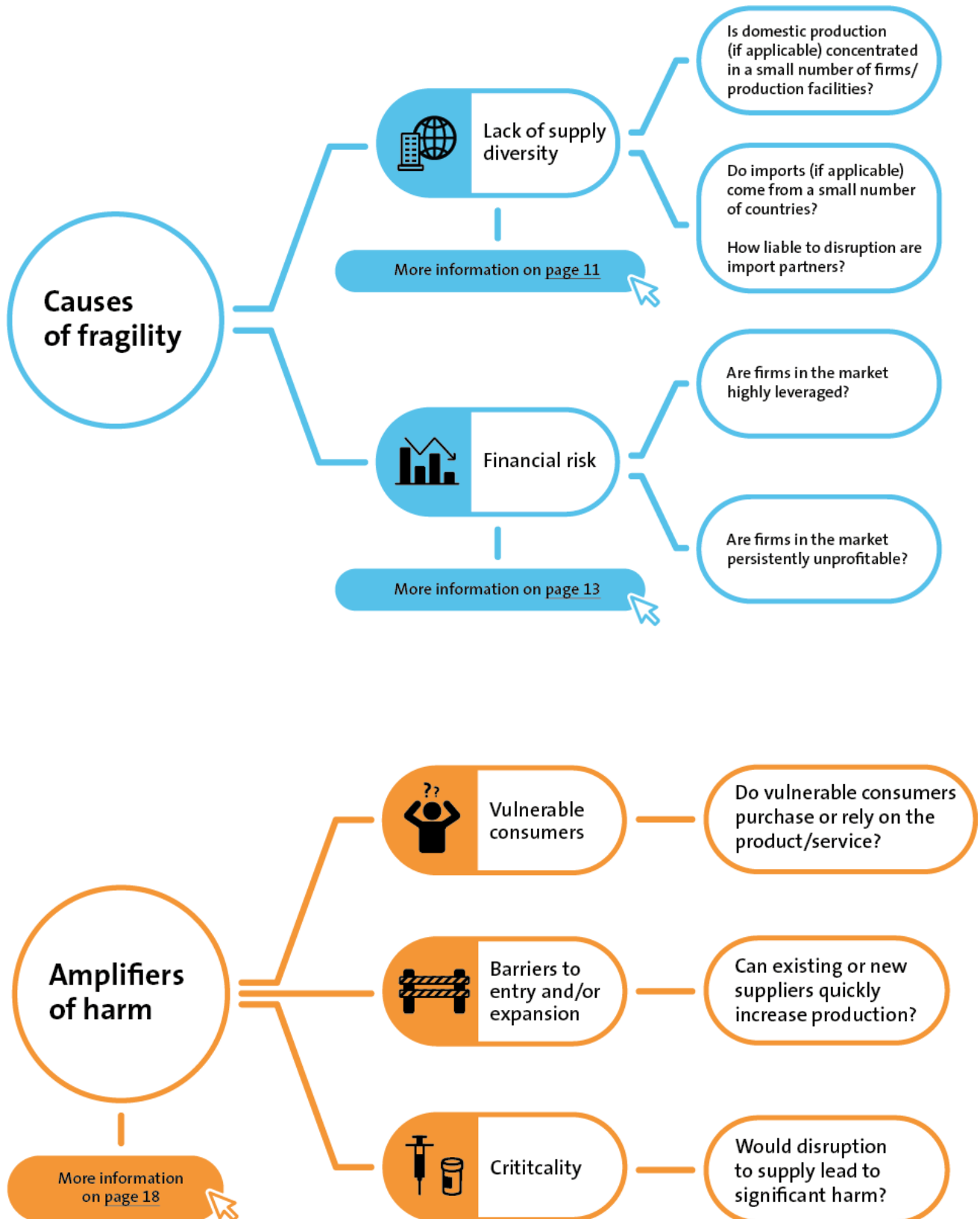
Overview

8. Many markets are naturally resilient. Although resilience is not normally a dimension of competition and choice,⁵ firms in competitive markets generally face strong commercial incentives to avoid periods where customers can't be supplied, to respond to surges in demand, and to operate in a financially sustainable way.
9. Moreover, from the perspective of customers, supply disruption need not always be a serious problem. They may be able to substitute for alternatives, or do without the product or service in question for short periods. However, in some markets – like critical production inputs, economic infrastructure, or essential services to vulnerable consumers – disruption can cause significant harm to customers, and its effects can spill over into the wider economy.
10. The factors driving market fragility can be complex. In an attempt to simplify, and to facilitate analysis and comparison, Figure 1, below, sets out a framework, illustrating features that are often present in markets that are vulnerable to supply disruption. It also summarises how these features might be measured or assessed.

⁴ [Competition and Markets Authority Annual Plan 2023 to 2024 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/115442/2023-2024-annual-plan.pdf)

⁵ That is, customers (especially end consumers) do not usually choose between rival firms according to how resilient they are, and firms in turn do not compete with each other to attract customers on this basis. Exceptions exist, however: see, for example, the [provisional findings report](#) of the CMA's 2016 inquiry into the anticipated merger of two suppliers of aircraft de-icer fluid ("We provisionally conclude that the two key dimensions of competition are price and security of supply".)

Figure 1: overview of the market resilience assessment framework



11. The framework distinguishes between two broad sets of features:
 - Causes of fragility: that is, features that can raise the risk of supply disruption, irrespective of the harm that disruption may cause.
 - Amplifiers of harm: that is, features that can aggravate or prolong the harm caused by supply disruption, and turn it into a potential crisis.

These features can reinforce one another, and as the case studies in Section 3 illustrate, in many instances of harmful supply disruption, it is often a combination of them that are present.⁶

12. The framework has been developed from a backward-looking review of markets that have, in the past, experienced fragility, some of which are described in more detail in the case studies in Section 3. Rather than being an analytically rigorous and complete description of the link between these features of fragility and resilience, the framework is intended to provide a toolkit to help understand, analyse and track risks in different markets, and develop responses that address the underlying features that are giving rise to harmful fragility.
13. Specific ways in which the framework can, in principle, be used are set out below, together with certain caveats and limitations that should be borne in mind:
 - **Assess the level of resilience, and potential for harmful disruption, in a given market.** Although markets displaying the features contained in the framework are generally likely to be more fragile, the framework does not assess any existing mitigations that might be in place to prevent disruption. For example, the retail banking market has several features that correspond to those in the framework; but a wide-ranging set of prudential and conduct rules, combined with regulatory supervision and enforcement, mitigate resilience risks.
 - **Look across the economy to determine which markets may be at risk of disruption.** However, data limitations and the need for

⁶ For example, firms supplying essential goods or services may be inclined to operate in a more risky way (for example, by taking on more financial risk, or by operating in a way that risks regulatory sanction) if they know they will have access to state support (bailouts or regulatory forbearance) when they are at risk of failure – the “moral hazard” problem. And governments and regulators may be less willing to accept their failure (and hence more inclined to provide support or forbearance) if they are one of a small number of suppliers in a concentrated market. This in turn helps to support these firms’ strong position in the market, raising barriers to entry and entrenching the underlying vulnerability.

qualitative assessments and judgement, mean that a cross-economy exercise to identify fragile markets would be a significant undertaking.

- **Identify measures which might be most effective in preventing and addressing market fragility.** By helping to identify the features in a market that are driving resilience problems, the framework can help to draw out where the CMA's work can support resilience, and which wider policy levers might be relevant.

14. The remainder of this section considers the market features set out in the framework, and how they might be assessed, in more detail.

Data limitations associated with resilience assessment

The assessment of market resilience can be supported with routinely-collected data.^a However, insufficient granularity, and difficulties in quantification of some of the features in the framework (for example, barriers to entry and expansion), mean that analysis of such data can generally only provide a starting point for further inquiry, rather than a meaningful assessment of market resilience. Some of these limitations can be overcome by bespoke data collection, including directly from firms operating in the market. Ultimately, however, robustly assessing the resilience of a market requires a combination of data, qualitative information and judgement.

- Generally, indicators of domestic concentration are only available at the level of 4/5-digit Standard Industrial Classification. This may provide further avenues of inquiry for those seeking to “horizon-scan” for fragile groups of markets or industries, but is generally insufficiently granular on its own to identify individual markets. An exception is the ONS Prodcom dataset, which includes data at product level, enabling domestic concentration indicators to be calculated for around 3,500 manufacturing goods.
- A lack of supply diversity for individual products arising from trade dependence on particular countries is easier to measure thanks to the granularity of UK trade statistics.
- Data to assess financial risks is available at a company level, which in principle allows for much more granular analysis of this aspect of the framework. In some cases, however, even this data might not capture the risk of companies abandoning unprofitable business lines (e.g. certain chemicals).
- The “amplifiers of harm” in the framework cannot straightforwardly be assessed solely using quantitative metrics; or at least, such metrics tell only a small part of the story. Qualitative assessment and judgement are also required to assess the presence and extent of these market features.

^a I.e. data regularly collected by statistical organisations, governments and other public authorities. Some of this data may only be available through secure access arrangements.

A closer look at the framework – causes of fragility

Lack of supply diversity

15. Supply diversity refers to the range of alternative suppliers for a good or service. A market in which there are a small number of suppliers, and/or where suppliers are concentrated in a particular location, has less supply diversity.
16. There are a number of ways in which a lack of supply diversity can reduce resilience:
 - Reliance on a small number of suppliers limits the alternatives when firm-specific disruptions occur,⁷ and reduces the ability of customers to multi-source as a way of insuring against supply disruption.⁸
 - In markets with a small number of suppliers, the commercial consequences of supply disruption (e.g. in the form of a permanent loss of market share) may be more limited. Firms may consequently be less incentivised to operate in a resilient way.
 - Large firms in concentrated markets supplying critical inputs may be more able to lock customers into exclusivity agreements. These agreements potentially damage resilience by reducing customers' ability to multi-source.⁹
 - Moral hazard may mean large suppliers in concentrated markets – particularly for critical goods and services – are more likely to operate in a less resilient way.¹⁰
 - Reliance on imports concentrated in one or a small number of countries creates exposure to location and country-specific risks: for example export restrictions, extreme weather events, sanctions, etc.¹¹
17. Two broad aspects of supply diversity are considered within the framework: domestic concentration, and import diversification and reliability.

⁷ For example cyber attacks, or plant shutdowns.

⁸ See, for example, Case Study 4 on forensic science services.

⁹ See, for example, Deutscher (2022), [Competition Law and Supply Chain Resilience – Towards a Research Agenda](#), CCP Working Paper 22-06

¹⁰ See, for example, [Independent Commission on Banking – Final Report, September 2011](#)

¹¹ See, for example, Case Study 6 on semiconductors.

Assessing lack of supply diversity	
Domestic concentration	Import diversification and reliability
Domestic concentration reflects the extent to which domestic production is concentrated in a small number of firms and/or production facilities.	This reflects the geographical diversification of imports; ¹² and relatedly, the extent to which their supply is at risk of disruption by virtue of their location of origin.
<p>Indicators:</p> <ul style="list-style-type: none"> - Concentration ratios produced by summing the market share of the largest market participants. For resilience purposes, it is recommended that C1, C2 and C3 – that is, the market shares of the largest, the two largest, and the three largest domestic suppliers – are assessed. Higher concentration ratios indicate a greater degree of dependence on a small number of domestic suppliers, and therefore a higher likelihood of supply disruption in the event of a firm-specific shock. - In principle, concentration ratios can also be calculated in respect of production facilities, to gain an insight into the risks attached to site-specific disruptions. 	<p>Indicators:¹³</p> <ul style="list-style-type: none"> - Export to import ratio. This is not directly relevant to resilience, but provides an indication of the extent to which domestic supply is available.¹⁴ Where (unconcentrated) domestic supply capacity exists, this may lessen concerns about import concentration or unreliability. - Import concentration. This measures the extent to which imports are sourced from a small number of countries. Both the import Herfindahl-Hirschman Index (HHI)¹⁵ and import concentration ratios can be used for this purpose. A higher HHI or concentration ratio indicates lower import diversification, and a higher risk of country-specific shocks causing disruption to supply. - Country-specific risks. These capture the fact that imports from some countries are more prone to disruption, whether natural or man-made. A number of organisations assess country-specific risks. Within government, the Joint Intelligence Organisation makes annual assessments of Countries at Risk of Instability.¹⁶

¹² In some instances, imports may not be a source of supply at all (e.g. in the case of services that can only be provided in person).

¹³ The indicators suggested here to measure import diversification and reliability are similar to those used by the Department for Business and Trade to assess supply chain vulnerabilities, as well as those used in analysis carried out by the [Government of Canada](#), the [Australian Productivity Commission](#) and the [European Commission](#).

¹⁴ For example, an export to import ratio greater than one indicates that in principle the UK could substitute imports with domestic production in the event of trade disruption. A preferable indicator in this context would be import dependence, i.e. the share of domestic demand met by imports. Data availability issues prevent the straightforward calculation of import dependence for most products and services

¹⁵ In this context, the HHI is the sum of squares of each partner country's share of UK imports for a particular product, multiplied by 1,000. The value ranges between 0 and 10,000. Analysis by the Canadian Government uses a threshold of 2,500 to define "products with low import diversification". The European Commission has used a threshold of 4,000.

¹⁶ [Joint Intelligence Organisation - GOV.UK \(www.gov.uk\)](#)

Can market concentration help resilience, and can competition harm it?

In many cases, larger firms may be better-equipped to weather shocks and crises than smaller ones: for example, they tend to have a wider range of external financing options, and they are better equipped to monitor and diversify their supply chains in the face of disruption. The UK supermarket sector, for instance, which consists of a relatively small number of large players, was able to successfully absorb and adapt to the impact of the pandemic, continuing to supply essential goods in the face of supply chain disruption, changing demand patterns, and a range of complex restrictions and regulations.

It does not follow, however, that highly concentrated markets are more resilient in general. For a start, the UK supermarket sector is relatively competitive (thanks in part to merger control).^a More generally, the structure that delivers the “optimal” mix of efficiency and resilience is likely to vary between markets, and the types of disruption to which they are exposed.^b And crucially, as the case studies in Section 3 illustrate, it is unlikely that structures in which firms have significant market power, or where they are protected from normal competitive forces because they are too important to fail, will deliver an appropriate level of resilience.

A similar argument might be made that resilience is undermined by “too much” competition. Fierce competition can in principle undermine resilience, for example when it causes firms to run financial risks in pursuit of market share, or to underinvest in spare capacity. But this dynamic can happen in oligopolies (for example, public procurement) as well as markets where there are many suppliers (retail energy). In markets where such risk-taking leads to unacceptable levels of consumer harm, the solution is not to restrain competition, but rather to ensure it is working effectively through appropriate regulation.

^a The CMA blocked the merger of two of the largest supermarkets – Sainsbury’s and Asda – in April 2019.

^b For example, in the UK service sector, larger firms outperformed SMEs in terms of turnover during the pandemic. But in manufacturing, there does not appear to have been a notable difference in performance between SMEs and larger firms. (ONS, [The impact of the coronavirus so far](#), 9 December 2020)

Financial risk

18. Financial risk refers to the risk of suppliers exiting a market for financial reasons. This could occur as a result of insolvency, or because they choose to cease supplying a particular good or service because it is insufficiently profitable.
19. In general, the exit of firms in such circumstances is a normal part of the competitive process, and there are risks attached to interventions that create barriers to such exit. However, financial risk may harm market resilience when a single firm representing a substantial market share, or a number of firms collectively representing a substantial market share, are liable to exit a market as a result of shocks or changes to trading conditions. In these

circumstances, the market may be at risk of a sudden and significant reduction in supply.

20. Two aspects of financial resilience are considered in the framework – leverage and profitability:

Assessing financial risk	
Leverage	Profitability
The extent to which suppliers are financed through debt, as opposed to equity. When firms are highly leveraged, they must generate consistent and sufficient cashflows to repay interest and adhere to debt covenants. Higher leverage thereby implies greater vulnerability to shocks and deteriorations in trading conditions.	Persistently unprofitable suppliers are at greater risk of failure (particularly if they are also highly leveraged), ¹⁷ and they may also be less likely to be sold in the event of insolvency. ¹⁸ At a more granular level, when individual products or services are unprofitable, they are at greater risk of being withdrawn.
<p>Recommended indicator:</p> <ul style="list-style-type: none"> - The gearing ratio – debt divided by equity – is the primary indicator recommended to measure leverage. 	<p>Recommended indicator:</p> <ul style="list-style-type: none"> - Operating profit – which indicates a firm's ability to generate revenues that meet its operating cost. EBITDA is recommended as the primary indicator of operating profit.¹⁹

21. These two aspects of financial resilience, and the underlying indicators, are highlighted in the framework because they are straightforward to calculate, are available for a wide range of firms, and can signify financial risks that may warrant further investigation. However, they would only ever provide a starting point for the assessment of financial resilience in a market: a thorough assessment requires analysis of a range of indicators, with a particular focus on those firms with larger market shares.²⁰ There are generally limitations to

¹⁷ In the context of rising demand, low profitability (even if it is not negative) can mean investment is insufficient to meet future needs.

¹⁸ By contrast, if a company is very indebted but profitable, an insolvency practitioner is likely to look to sell it as a going concern.

¹⁹ Table 1 of the [Appendix A](#) to the CMA's Children's care market study sets out various measures of operating profit and how they are calculated.

²⁰ See, for example, [Appendix A](#) of the CMA's Children's Social Care market study. The government's [Model Services Contract](#) (Schedule 18, p.337) also provides examples of indicators that can be used to assess the financial standing of firms. Ofwat's [annual report on financial resilience](#) among water companies also contains a list of indicators (including leverage and profit margins) that can be used to assess financial risk (see p.11 of the 2021/22 edition). Commonly used additional indicators include credit ratings (forward-looking opinions about a firm's creditworthiness) and indicators of liquidity, such as the interest cover ratio. Trends in the overall size of a market, and patterns of firm exit can also provide an indication of potential financial risks to suppliers.

how far publicly-available financial information can assist with such an assessment. In particular:

- financial engineering can mean firms are more leveraged than their accounts suggest;
- publicly reported financial information may not be sufficiently timely or complete, particularly in the case of unlisted companies;
- profitability is not generally disaggregated across different products or services sold. Overall figures may thus conceal the risk that individual business lines may be unprofitable, and a firm may be at risk of exiting a particular market.

A rigorous assessment of financial risk may therefore require information to be collected directly from firms. The CMA has previously recommended that such collection be carried out in markets that face resilience issues, notably as part of a market monitoring and oversight regimes in the audit and children's social care markets (see Case Studies 3 and 7).

A closer look at the framework – amplifiers of harm

22. The extent of harm arising from supply disruption varies between markets. The framework set out three “amplifiers of harm”: that is, features that can aggravate or prolong the harm caused by supply disruption, and turn it into a potential crisis. The presence and extent of these features cannot generally be “measured” by reference to a single indicator, but instead is likely to require a combination of quantitative and qualitative evidence, and a degree of judgement. Questions pertinent to this assessment, together with relevant data sources, are set out in the table and footnotes at the end of this section. The three features are described in more detail below.

Criticality

23. A good or service is critical when disruption to its supply would lead to significant harm, owing to its importance to consumers, businesses, society or government, and the difficulty of substituting it for alternatives.
24. The framework distinguishes between three broad categories of critical goods and services:
- Critical inputs, where interruption to supply would cause harmful disruption in downstream markets. This harm may arise, for example, because the input is necessary in a wide range of different production processes²¹, and/or because it critical to the production of a final good or service that is essential for end consumers. Critical inputs are often goods, but can include services (e.g. the licensing of intellectual property).
 - Critical services that underpin production and distribution across the economy. This includes network infrastructure, the financial system, and transport and logistics services. Disruption to the supply of these services can have significant spillover effects to the wider economy.
 - Goods and services that are essential to end consumers,²² who therefore stand to be harmed directly by any disruption to supply.

Barriers to entry and/or expansion

25. When supply is disrupted, the duration of the disruption will depend in part on how quickly remaining suppliers can expand production to meet demand, and/or how quickly new suppliers can enter the market and do the same. If

²¹ For example, chemicals or raw materials.

²² “Consumers” in this context includes users and beneficiaries of state-provided/state-funded services.

there are significant barriers to entry or expansion, the duration of disruption, is likely to be prolonged, and the harm arising from it correspondingly greater.

26. The framework distinguishes between two broad categories of barriers to entry and expansion.
- **Structural barriers.** These include economies of scale, sunk costs and network effects that mean entry or significant expansion can only be profitable on a large scale (and therefore entails a high risk). Sometimes it is possible to quantify these kinds of barriers because it is known in advance how much it will cost to build an efficient plant or to purchase necessary inputs.
 - **Policy barriers** that prevent entry and expansion can derive from regulation (e.g. licensing restrictions, high compliance costs); trade barriers; procurement practices (e.g. favouring large, established suppliers); selective subsidies and tax reliefs; implicit guarantees; intellectual property rights.

Consumer vulnerability

27. Consumer vulnerability refers to any situation in which an individual may be unable to engage effectively in a market. In line with previous CMA work,²³ the framework distinguishes between two broad categories of consumer vulnerability:
- Market-specific vulnerability, which derives from the specific context of particular markets, and can affect a broad range of consumers within those markets. Examples include the provision of funerals, and complex financial services.
 - Vulnerability associated with personal characteristics such as physical disability, poor mental health or low incomes, which may result in individuals with those characteristics facing particularly severe, persistent problems across markets.
28. Relative to other consumers, vulnerable consumers may experience particular harm from supply disruption. For example:
- They may struggle to switch to alternatives, either because they have difficulties assessing their availability, or they are unaffordable or inaccessible. This may mean products that are substitutable (and

²³ [Consumer vulnerability: challenges and potential solutions - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

therefore less essential) for other consumers are still essential for vulnerable consumers.

- They may face supply disruption where others don't. For instance, where resilience issues lead to high price rises, low-income vulnerable consumers are less likely to be able to pay (e.g. in retail energy markets, vulnerable consumers have been more likely to respond to price rises through "self-disconnection").²⁴

²⁴ [PPM self-disconnection short report.pdf \(citizensadvice.org.uk\)](#)

Assessing amplifiers of harm

Criticality	Barriers to entry and/or expansion	Consumer vulnerability
<p><u>Key concepts</u></p> <ul style="list-style-type: none"> - Critical inputs, where interruption to supply would cause harmful disruption in downstream markets. - Critical services that underpin production and distribution across the economy. - Goods and services that are essential to end consumers. <p><u>Questions to ask to assess whether feature is present</u></p> <ul style="list-style-type: none"> - Has the good been identified by government as critical, e.g. to national security, human health, essential services or the economy?²⁵ - Is the good or service part of a critical national infrastructure sector, or essential to its delivery?²⁶ - (For critical inputs) What sectors and markets depend on this input? Are any of these, in turn, critical inputs, critical services, or critical to end consumers?²⁷ - Could the good or service be substituted for alternatives? Over what time period could substitution be achieved, and what would be the costs in doing so? 	<p><u>Key concepts</u></p> <ul style="list-style-type: none"> - Structural barriers: that is, the unavoidable costs associated with entering a market or expanding production. These include economies of scale and/or sunk costs that mean entry or significant expansion can only be profitable on a large scale (and therefore entails a high risk). - Policy barriers: that is, actions and measures (including regulation) by government that affect the ability of suppliers to enter and expand. <p><u>Questions to ask to assess whether feature is present</u></p> <ul style="list-style-type: none"> - Has there been recent history of market entry, or significant changes to market shares? - What is the level of capacity utilisation among existing suppliers? - If the product is imported, are there diversification opportunities?²⁸ Are barriers to trade present that may prevent or hinder import diversification? - What labour market skills are required to produce the good or service; are these specialised and/or short supply?²⁹ - Is production capital intensive? - Is the good or service highly regulated? How long and costly is regulatory approval process? 	<p><u>Key concepts</u></p> <ul style="list-style-type: none"> - Market-specific vulnerability, which derives from the specific context of particular markets, and can affect a broad range of consumers within those markets. - Vulnerability associated with personal characteristics such as physical disability, poor mental health or low incomes, which may result in individuals with those characteristics facing particularly severe, persistent problems across markets. <p><u>Questions to ask to assess whether feature is present</u></p> <ul style="list-style-type: none"> - Is the product complex, and/or likely to be purchased by consumers at a time of distress? - Relative to the general population, is the product consumed disproportionately by individuals with characteristics that may make them vulnerable?

²⁵ The UK government does not publish a list of such goods. Published lists of critical goods by other governments include [the US Department of Commerce list of products in supply chains of critical sectors and subsectors](#). The US and European Commission also maintain lists of critical minerals and raw materials (US Geological Survey, [List of critical minerals](#); European Commission, [Study on the EU's list of Critical Raw Materials](#)).

²⁶ UK Critical National Infrastructure incorporates 13 sectors: Chemicals, Civil Nuclear, Communications, Defence, Emergency Services, Energy, Finance, Food, Government, Health, Space, Transport and Water

Energy supply and market resilience

Virtually all economic activity depends on the supply of energy. Large rises in energy prices following the post-pandemic “reopening” of the global economy, and compounded by Russia's invasion of Ukraine, have prompted concerns about both the resilience and affordability of the UK's energy supply. The UK's most recent Energy Security Strategy emphasises the importance of achieving resilience by reducing dependence on unreliable fossil fuel imports; through increasing domestic supply diversity and capacity; and through demand management and moderation (e.g. energy efficiency).^a

Although every sector of the economy is affected by rising energy prices, the impact is especially pronounced in industries that are energy intensive. In some cases, businesses affected by high energy prices will respond by adjusting prices, profits and other costs (e.g. wages). In others, however, high energy prices may create a risk of supply disruption. This may occur, for example, when UK energy costs rise to a greater extent than in other parts of the world, rendering domestic production relatively unprofitable, leading to firm failure, strategic exit and/or offshoring of production. This in turn can harm resilience by reducing the number of domestic suppliers (or eliminating them entirely), and leaving the UK more dependent on imports. Case study 1, on the supply of carbon dioxide, provides a practical example of this dynamic.

With reference to the framework, high energy intensity of production, in the context of rising energy prices, could be treated as a financial risk.

^a [British energy security strategy](#) – UK Government policy paper, April 2022

²⁶ Supply and use tables can be used to help determine the importance of goods as inputs to different industries. In 2012, the US Bureau for Economic Analysis published detailed supply and use tables covering 405 different industries in the United States. The ONS publishes less detailed tables for the UK annually.

²⁷ I.e. could the product in principle be sourced from other countries?

²⁸ The Migration Advisory Committee is commissioned periodically by the UK government to produce a list of occupations where skills are in short supply within the UK resident labour market. (See, for example, [Review of the shortage occupation list: 2020](#))

3. Case studies

29. This section sets out a series of case studies of markets that have experienced resilience problems. The purpose of the case studies is:

- to illustrate how the market features in framework described in Section 2 can drive resilience problems;
- to explain how competition policy and wider government policy can affect these market features (positively and negatively);
- to demonstrate how assessments of resilience against the framework can be carried out in practice.

Case study 1: carbon dioxide (CO2)

CO2 is used in a wide variety of products and processes, from carbonating soft drinks and beer, to stunning animals before slaughter, and prolonging the shelf life of food and preserving it for transport. CO2, as dry ice, is also used as a coolant for medicines and vaccines, and in nuclear power plants.

Most CO2 currently supplied for these purposes is a by-product of either ammonia or bioethanol production. In September 2021, CF Fertilisers (CFF) – a major supplier – halted production of ammonia (and hence CO2) at both of its UK sites, blaming high natural gas prices. This led to widespread concerns about CO2 shortages, and emergency intervention by government to support production (see below).

Resilience assessment

Feature	Sub-feature	RAG rating	Description
Supply diversity	Domestic concentration	Yellow	Before CF industries suspended UK production, around a half of domestic production came from one of its plants. Domestic production is now concentrated at one bioethanol plant, operated by Ensus, and a number of smaller anaerobic digestion (biogas) plants.
	Import diversification/reliability	Yellow	The characteristics of CO2 – particularly the specialist requirements for transporting it, and difficulties of stockpiling – make imports into the UK difficult, though not impossible. Following CFF's second shutdown in autumn 2022, imports have increased substantially. Imports are concentrated (import HHI of around 4,500 and largest country partner has 66% share), but not in high-risk countries. ³¹
Financial risk	Leverage	Green	Major domestic suppliers do not appear to be operating with high leverage.
	Profitability	Red	High energy costs have made the domestic production of ammonia (and hence CO2 from this source) increasingly uneconomic. This led to the permanent closure of one of CFF's two production facilities, and the halting of production at another. Bioethanol-based CO2 production is also energy-intensive. For CO2 specifically, there is the added challenge that, because the main supply sources are relatively low-value byproducts of either ammonia or bioethanol production. Commercial incentives to cut or cease production or exit are therefore not necessarily aligned with the needs of CO2 customers.
Criticality	Critical input / critical service/ essential to end consumer	Red	Critical input for freezing goods for transport, slaughter of animals, healthcare, nuclear, water purification.
Barriers to entry/ expansion	Structural	Yellow	Ammonia- and bioethanol-based CO2 production is capital intensive highly specialised. Some evidence of recent entry and expansion from other CO2 sources (biogas).
	Policy related	Yellow	Substantial regulatory barriers to the production of both ammonia and bioethanol.
Demand characteristics	Vulnerable consumers	Green	Not directly purchased by vulnerable consumers.

Role of competition policy

The UK's high dependence on a small number of CO₂ suppliers is partly explained by consolidation through mergers. Prior to 2007, there were two principal suppliers of ammonia-based CO₂: Terra, which owned facilities at Billingham and Severnside; and Kemira, which owned a facility at Ince. In 2007, the CC cleared a Joint Venture (JV) between the two producers, called GrowHow, which, after a series of transactions (which were not scrutinized at UK or EU level) came to be fully owned by CF Industries in 2015, and rebranded to CF Fertilisers (CFF). The 2007 JV was cleared on the basis of a number of remedies, including a commitment not to terminate a contract to supply a key customer from one of its production facilities. However this remedy did not prove effective in preventing the closure of that facility in September 2021.

Wider government policy

Previous shutdowns of ammonia production facilities (in 2005/6, 2007, 2008/9 and 2018) – and consequent risks to CO₂ supply – did not prompt government intervention. However, following CFF's decision to halt production in September 2021, the UK government stepped in to provide financial support to prevent an interruption to supply. This comprised a 3-week arrangement that allowed CFF to continue operating whilst the industry worked towards an agreement. Following that intervention³², operation in Billingham temporarily resumed, and – after a series of industry agreements – continued into 2022. To facilitate these agreements, the Secretary of State also temporarily exempted companies involved in the supply and distribution of CO₂ from certain competition law prohibitions to facilitate the negotiation of these agreements.³³

However, without a long-term change to CFF's commercial incentives, and with high natural gas prices persisting, by autumn 2022, the company permanently closed its Ince plant and then went on temporarily to halt production of ammonia at the Billingham site, too.

Looking ahead

At the time of writing, the two domestic production facilities supplying ammonia-based CO₂ are shut (one permanently, and the other temporarily since August 2022). This has left an even more concentrated market for domestic supply. Although no shortages have yet occurred, and there is some evidence that imports and alternative sources of CO₂ (notably biogas) are growing to meet demand, supply constraints

³¹ [UK Trade Info database](#)

³² [Government secures agreement to ensure CO₂ supplies - GOV.UK \(www.gov.uk\)](#)

³³ [Ibid](#)

have led to higher prices.³⁴ There is little role for the CMA in alleviating the situation the short term. There may, however, be merit in consideration by others of wider measures, in particular to support supply diversity, and reduce the potential harm from future disruptions. For example:

- Examining domestically-available alternatives to ammonia-based CO₂ (e.g. bioethanol and biogas), including the commercial incentives of producers, and barriers to expansion and new entry.
- Assessing capacity and infrastructure to import, and exploring opportunities for import diversification.
- Assessing the criticality of CO₂ for different uses, and in particular options and incentives for substituting for more widely-available alternatives in the short-, medium- and long-term.³⁵
- Over the longer term, exploring the potential for other less used sources of supply, such as carbon capture and utilisation, or combined heat and power plants.

³⁴ The weighted average price of imported CO₂ was more than twice as high in 2022 as in the preceding year. See also: [Energy & Climate Intelligence Unit | Gas prices adding £1.7 billion... \(eciu.net\)](#)

Case Study 2: infant formula (US)

Infant formula mimics the nutritional composition of breast milk. It is a highly-regulated product that is difficult to bring to market. For many years, three providers have dominated the formula market in the US:³⁶ Abbott, Mead-Johnson, and Nestlé.³⁷ This dependence was a contributing factor to recent supply disruption: a major plant run by Abbott was shut down following the discovery of bacteria at the site in February 2022, and then again following storms in June 2022. This resulted in significant shortages, the duration and impact of which were amplified by policies that restricted entry from overseas suppliers. By May 2022, 40% of retailers were out of stock of formula milk, and parents were facing scams and price gouging.³⁸

Resilience assessment

Metric	Sub-metric	RAG rating	Description
Supply diversity	Domestic concentration	Red	C3 is around 95%, with concentration at state level higher still. ³⁹ Production facilities are also reported to be concentrated.
	Import diversification/reliability	Yellow	Wide-ranging import restrictions – including tariffs, tariff-rate quotas, and non-tariff barriers such as ingredient and labelling requirements – mean imports represent a very small share of overall supply (around 2% of domestic production in 2021). ⁴⁰ Some of these restrictions were relaxed in the aftermath of the crisis. ⁴¹
Financial risk	Leverage	Grey	not assessed
	Profitability	Grey	Business-line profitability data not available. Overall the size of the market in the US is shrinking as a result of declining births. ⁴²
Criticality	Critical input / critical service / essential to end consumer	Red	Essential good to feed newborns, particularly for parents unable to breastfeed.
Barriers	Structural	Yellow	Highly specialised manufacturing process. First new manufacturer for 15 years in the US was registered 2022, off the back of a \$190m in pre-market funding. ⁴³
	Policy-related	Red	Regulatory barriers to entry (e.g. rigorous testing requirements to get approval); WIC procurement favours large incumbents in award of exclusive contracts.
Demand characteristics	Vulnerable consumers	Yellow	Essential good for families with newborns; lower income families are more likely to rely on infant formula than breastfeeding. ⁴⁴

³⁶ American Progress, [The national baby formula shortage and the inequitable U.S. food system](#), June 2022

³⁷ In November 2022, Perrigo Company plc [announced](#) that it had bought the US and Canadian rights and manufacturing facilities related to Nestlé's infant formula brand.

³⁸ [Datasembly releases latest numbers on baby formula](#), 10 May 2022

³⁹ [Memorandum to the House Subcommittee on Oversight and Investigations from the Staff of the Committee on Energy and Commerce](#), 23 May 2022

⁴⁰ [IN11932 \(congress.gov\)](#)

⁴¹ <https://www.fda.gov/news-events/press-announcements/fda-encourages-importation-safe-infant-formula-and-other-flexibilities-further-increase-availability>

⁴² <https://www.statista.com/statistics/195908/number-of-births-in-the-united-states-since-1990/>

⁴³ Forbes, [A startup wanted to make a better baby formula. It took five long years](#). 17 May 2022

⁴⁴ See, for example, [Sociodemographic predictors of exclusive breast-feeding among low-income women attending a Special Supplemental Nutrition Program for Women, Infants, and Children \(WIC\) programme](#), Public Health Nutrition 22 (9) (2019),

Competition policy

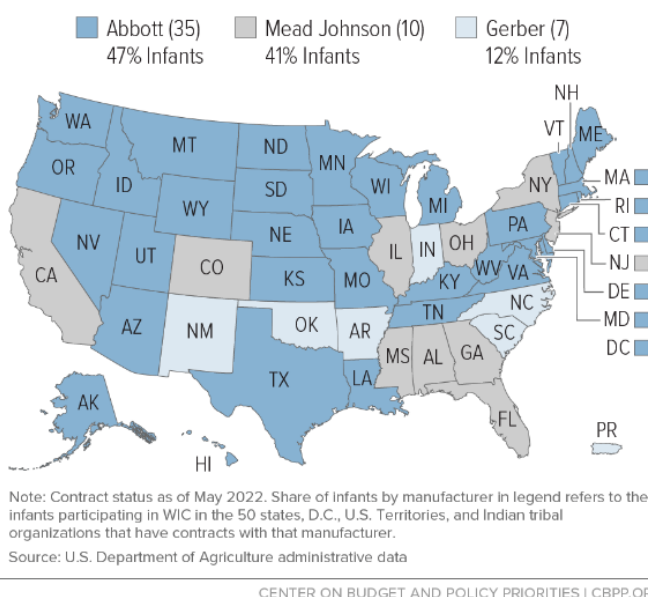
In May 2022, the FTC launched an investigation “to identify the factors that contributed to the shortage or hampered our ability to respond to it”. Among other things, it is set to “examine the pattern of mergers and acquisitions in the infant formula market to better understand current concentration, how it came to be, and how that should inform future merger review.”⁴⁵

Wider US government policy

Competition in the US market for infant formula has been significantly influenced by government policy, and in particular import restrictions and procurement practices.

Procurement

Three Manufacturers Supply WIC Infant Formula



Source: [Infant Formula Shortage Highlights WIC's Critical Role in Feeding Babies](#). Center on Budget and Policy Priorities, June 2022

Around half of all baby infant formula⁴⁶ in the US is bought by a programme run by the Department of Agriculture (known as the Special Supplemental Nutrition Program for Women, Infant, and Children or WIC). This programme awards exclusive contracts at state level to the bidder who offers the most significant discount (with some states running joint bidding processes, and awarding the contract to the same manufacturer). On the one hand, the programme creates vigorous competition *for* the market⁴⁷, with manufacturers bidding aggressively to win the WIC contract, thereby reducing government costs. On the other, it exacerbates already-high concentration (and hence fragility) in the market, with the winner controlling

⁴⁵ [FTC launches investigation into infant formula shortage](#)

⁴⁶ [How the baby formula shortage links back to a federal nutrition program - POLITICO](#). Also [The National Baby Formula Shortage and the Inequitable U.S. Food System - Center for American Progress](#)

⁴⁷ [WIC's Competitive Bidding Process for Infant Formula Is Highly Cost-Effective | Center on Budget and Policy Priorities \(cbpp.org\)](#)

a significant share of supply at state level,⁴⁸ and reportedly gaining an advantage over non-WIC brands on retailers' shelves.⁴⁹

Import restrictions

There have been wide-ranging restrictions on imports of infant formula into the US, including tariffs, tariff-rate quotas, and non-tariff barriers such as ingredient and labelling requirements. Together, this makes the US an unattractive market for overseas suppliers. The absence of overseas supply is likely to have contributed both to the fragility of the market, and the duration of the disruption.⁵⁰

Conclusions

The US infant formula shortage illustrates the powerful effects that government policy can have on both competition and resilience. In this case, policies intended to safeguard consumers and achieve value for money for the taxpayer led as a side-effect to a more fragile market; one that experienced prolonged and widespread shortages of an essential good following disruption at a single production facility. More positively, it shows that, designed well, and with the promotion of supply diversity in mind, procurement practices and trade policy can support resilience.

⁴⁸ [How the WIC program created the conditions that caused the baby formula shortage : The Indicator from Planet Money : NPR](#)

⁴⁹ For example, in California, in 2007, a WIC contract change from Abbott to Mead Johnson caused the former's market share to drop from 90 percent to 5 percent, while the latter's share did the opposite—rising from 5 percent to 95 percent.

⁵⁰ As part of the response to the crisis, the Biden administration has airlifted formula milk from Australia and Europe.

Case Study 3: Audit

Effective capital markets, and by extension the wider economy, depend on companies providing reliable information about their finances and performance. Audits provide an essential independent check on the information that companies produce. In doing so, robust, challenging audits increase trust in business and markets, improve the allocation of capital and ultimately support better economic outcomes for the benefit of all. Conversely, recurring audit failures lead to wasted capital and opportunities, and erode trust in markets.

In the UK (and many other countries), the market for audit services, particularly to larger companies, has long been dominated by the so-called “Big Four”. But rules around conflicts of interest and “rotation” of audit providers mean that, in practice, choice is even more limited than that number implies. A quarter of the most important audits had only one or two bidders to choose from in recent years. If one of the Big Four exited the market, many of the UK’s largest companies would be left with no choice at all. So, not only is there little real choice, but the current setup is also a threat to the resilience of the system. The Big Four are too few to fail and, according to the CMA’s assessment in its 2019 market study (see below), this has been a contributing factor to shortcomings in audit quality.

Resilience Assessment

Metric	Sub-metric	RAG rating	Description
Supply diversity	Domestic concentration	Red	Around 97% of audits of UK FTSE350 companies are undertaken by Deloitte, Ernst and Young, KPMG and PwC ⁵¹ . Rotation rules mean effective concentration is higher than this figure implies.
	Import availability/ diversification	Grey	Not applicable.
Financial risk	Leverage	Grey	Not applicable
	Profitability	Yellow	Audit is a relatively unprofitable part of the largest firms’ business (compared with non-audit work). However, diversified business model may reduce risk of supplier failure.
Criticality	Critical input / critical service / essential to end consumer	Red	Critical service. All companies above a turnover threshold must have their accounts audited. High-quality audit increases trust in business and markets, improves the allocation of capital and ultimately support better economic outcomes.
Barriers	Structural	Red	No new entry of a major auditor in at least years. Capability, capacity and reputational barriers all hamper the ability of “challenger” audit firms to compete against Big 4.
	Policy related	Yellow	On the demand side, challenger firms often don’t have the required expertise, experience international networks, scale and reputation as the Big Four. Constraints on the supply side include tender and regulatory costs.
Demand characteristics	Vulnerable consumers	Green	Not directly purchased by vulnerable consumer, but certain vulnerable groups (like pensioners) may be disproportionately affected by bad investment decisions.

Role of competition policy

Before 1987, there were eight large international audit firms in the UK. That number fell to five following mergers in 1987, 1989, and 1998, all of which were cleared by competition authorities with little, if any, consideration of

⁵¹ Restoring trust in audit and corporate governance - GOV.UK (www.gov.uk), March 2021, page 16.

resilience. And the Big Five became the Big Four in 2002, following the demise of Arthur Andersen in the wake of the Enron scandal.

Following a string of high-profile audit failures, and widespread concern about the functioning of the market, the CMA launched a market study into audit services in 2018. Its final report highlighted the risks and consequences of the failure of a Big Four firm, and concluded that “the primary way to mitigate this risk is to increase the number of credible audit firms”. It made various recommendations to (among other things) improve supply diversity and resilience.

The CMA published its findings of the [audit market](#) in 2019, looking further into the determinants behind audit quality. A key finding of the CMA’s study was that the market exhibits high concentration among four big audit firms, resulting in limited choice and lack of resilience.

Importantly, the market study also identified market characteristics which go beyond high market concentration, and which may also directly impact on the quality of audits:

- Informational barriers - particularly the difficulty of judging the quality of audits, and the fact that typical savers and pensioners do not select auditors directly.
- Entry barriers – particularly the difficulty for new challenger auditors to disrupt the market, due to capability, capacity, and reputational barriers.
- Expansion barriers – particularly commercial incentives and necessary regulatory rules that prevent existing firms from bidding for audit work when there are conflicting interests between audit and non-audit work, further limiting choice.

Looking ahead

The government has committed to regulatory reform of the UK’s audit regime, to support new and “challenger firms”, and to create a market where the largest firms can, in principle, exit, without causing intolerable disruption and loss of competition.⁵² However, the need for complex interventions to support “challenger” firms may not have been necessary had resilience risks – and particularly the risks of leaving so few providers of an essential service – been given greater prominence in merger assessments at the time.

⁵² [Restoring trust in audit and corporate governance - GOV.UK \(www.gov.uk\)](#)

Case Study 4: forensic science services

Effective forensic science services are pivotal to the delivery of justice. Since 2012, following the closure of the publicly-owned Forensic Science Service, these services have been supplied by private sector providers (under contract from police forces), and “in-house” by police laboratories.

The sector is widely recognised as fragile. It has shrunk in size (from around £120m in 2012⁵³ to around £65m in 2021) as in-house provision has grown and police authorities – themselves under financial pressure – have driven harder bargains with private sector contractors. These financial risks, and the high level of market concentration (three providers account for over 90% of private sector supply) have on a number of occasions put at risk service continuity. In particular:

- One of the largest providers of forensic services went into administration January 2018, threatening the integrity of 2,000 live cases across 30 police forces, together with the company’s archive of former cases. Public sector funds were used to support the firm’s operations for three months to allow it to continue processing cases and to find a buyer, although disruption was not avoided altogether.⁵⁴
- In 2019, Eurofins, which accounted for around 60% of forensic science provision in England and Wales, was targeted in a ransomware attack. The firm was temporarily suspended from police work, and forensic submissions had to be reallocated to other suppliers, creating delays to investigations, and postponements to court hearings. The firm subsequently regained access to its IT systems and police contracts.⁵⁵
- Randox Testing Services, a major provider of toxicology services, exited the market in November 2018 after evidence came to light that employees had manipulated forensics data. Forensic tests in over 10,000 cases across almost all police forces needed to be re-examined, and to date, 41 criminal convictions have been overturned as a consequence.⁵⁶

Role of competition policy

There have been no merger inquiries by the CMA in the sector: the most significant transaction in recent years involved the acquisition of a UK provider (LGC) by a firm with no operations in the UK (Eurofins).

⁵³ Written evidence from Randox Testing Services to the Lords Science and Technology Committee inquiry into Forensic science and the criminal justice system ([FRS0099](#))

⁵⁴ See, for instance, Police Oracle, [Police pay out millions after collapse of forensics firm](#), 1 February 2018

⁵⁵ [Mayor’s Office for Policing and Crime, DMPC Decision – PCD 901](#) (July 2020). The EFS shut down lasted for 8 weeks, with a phased resumption of services after that point.

⁵⁶ National Police Chiefs’ Council, [National operation to retest manipulated forensic samples continues](#), 6 December 2018

Resilience Assessment

Metric	Sub-metric	RAG rating	Description
Supply diversity	Domestic concentration	Yellow	Highly concentrated. C3 around 90%. Within specific forensic disciplines, concentration may be still higher.
	Import availability/ diversification	Red	No overseas suppliers, owing to the complexity and risk attached to sending forensic samples abroad for testing.
Financial risk	Leverage	Yellow	Certain providers are operating with high leverage.
	Profitability	Red	Fierce price competition has led to very low profitability. The overall size of the market declined from around £120m in 2012 a decade ago to around £65m in 2021. A major provider went into administration in 2018.
Criticality	Critical input / critical service / essential to end consumer	Red	Critical service. Essential to the administration of justice.
Barriers	Structural	Yellow	Involves highly specialised equipment and skills. Rapid increase in backlogs following previous disruptions of major suppliers indicates barriers to expansion. No new entry of a major provider since privatisation in 2012.
	Policy related	Yellow	Rigorous accreditation process: significant investment in staff, laboratories and equipment required to achieve quality standards required to bid for police forensic contracts. Procurement procedures in certain cases likely to favour large suppliers and inhibit entry and expansion.
Demand characteristics	Vulnerable consumers	Green	Not directly purchased by vulnerable consumers.

Wider government policy

The police are by far the most important buyer of forensic services, and traditionally groups of forces have procured jointly. Their decisions on whether, how and on what terms to purchase have therefore had an important impact on competitive structure and profitability in the forensics market, and hence its resilience. A number of concerns have in the past been raised around the impact of government on the forensics market, including:

- The timing of tenders, combined with their size and the high weighting of price in bid evaluation, caused suppliers to compete intensely on price, weakening their financial resilience.
- In certain respects, private suppliers were in a disadvantageous competitive position vis a vis “in house” police provision. In particular, in-house providers could operate without accreditation and could put certain costs (e.g. estates) onto other budgets.

Steps have been taken in recent years to improve market resilience, including short-term price uplifts to contracts; a new, centrally-administered Dynamic Purchasing System for procurement; and a long-term Forensic Marketplace Strategic Plan.

Looking ahead

Government will continue to have a pivotal role in shaping the forensic services market. Future resilience will depend on maintaining commercial strategies and procurement practices that enable efficient providers to be financially sustainable, and, over the long term, create conditions for new entry and expansion where it is required, such as in digital forensics.

Case Study 5: Chlorine and caustic soda (UK)

Chlorine is a key building block of modern chemistry used in three principal ways: as a raw material for chlorine-containing products (e.g. plastics, pharmaceuticals, pesticides); as an intermediate to manufacture non-chlorinated products (e.g. polycarbonates and polyurethanes); and direct use (e.g. water purification). Caustic soda is used in many chemical processes but also everyday products like soaps and detergents. It is also widely used in the food sector and for wastewater treatment.⁵⁷ Both chlorine and caustic soda are produced simultaneously through electrolysis, a highly energy intensive process that makes production costs sensitive to electricity prices.

Due to the cost and infrastructure required to transport these products long distances, the UK relies heavily on domestic production (for chlorine in particular, imports account for less than 1 per cent of total consumption)⁵⁸. Chlorine and caustic soda in the UK are predominantly produced by two companies – INEOS Inovyn and Vynova – at a site in Runcorn, Cheshire.⁵⁹ This domestic concentration is not necessarily a vulnerability for downstream products that use chlorine (such as plastics), which can be more easily imported. But for direct use, it may be a source of fragility.⁶⁰ INEOS has estimated that 98% of UK water purification is dependent on Runcorn chemicals.⁶¹

Moreover, essential direct uses, such as waste treatment, account for a relatively small share of total demand. While this means overall supply is likely to exceed the requirements of essential users as long as domestic production facilities remain open, commercial decisions about whether to shut production facilities (temporarily or permanently) are likely to be driven by wider market conditions, and in particular the relative competitiveness of production facilities vis a vis overseas competitors. As with CO₂ production, relative energy costs are likely to play an important role in determining the commercial viability of production facilities.

Role of competition policy

Although merger review can often be important in preventing loss of supply diversity, in this case, dependence on the Runcorn site did not arise from mergers, and it has long accounted for a large share of UK chlorine production.⁶² Mergers and acquisitions involving the Runcorn site and assets have been reviewed by the European Commission, but the companies involved did not compete in the same products in the UK market. Thus, even though the supply of chlorine and caustic soda was highly concentrated at the time of the

⁵⁷ In particular, caustic soda is used as an industrial cleaning agent across the meat and poultry sectors, both on farms and in slaughterhouses. Other applications include as a peeling agent in cured and tinned food, as a kneading agent in baking, and as an alkaliser in drinks.

⁵⁸ [UK Trade Info database](#) and [Eurochlor, Chlor-alkali industry review, 2021-22](#)

⁵⁹ There are three plants in the UK, of which Runcorn accounts for almost 90% of chlorine production. ([Eurochlor, Chlor-alkali industry review, 2021-22](#))

⁶⁰ Calcium hypochlorite, which is not in gas form, and is used to clean swimming pools, can be more importable. In summer 2022, global plant shutdowns and other supply constraints appear to have contributed to a national shortage, forcing several lidos and swimming pools across the UK to temporarily close.

⁶¹ [98% of UK water purified with Runcorn chemicals | INEOS INTV 23 - YouTube](#)

⁶² As recently as 2005, the UK had six production sites, although Runcorn still accounted for over 70% of domestic production. The transition away from mercury-based production processes to less energy-intensive membrane technology led to the closure of four of these sites during 2005-6, leaving only Runcorn and a much smaller facility at Thetford. In 2013 a new facility at West Thurrock opened, which currently accounts for around 10% of UK chlorine production capacity.

transaction, there was judged to be no *increase* in concentration, and no additional loss to competition in the UK, arising from it.⁶³

Resilience assessment

Metric	Sub-metric	RAG rating	Description
Supply diversity	Domestic concentration	Red	High concentration of firms and production facilities. Inovyn and Vynova operate a site Runcorn, in a joint venture under the name Runcorn MCP Limited. For chlorine this site accounts for almost 90 per cent of total domestic production ⁶⁴ .
	Import availability/dependency	Red	High dependence on domestic production. For chlorine, imports estimated to be less than 1 per cent of total consumption, due to high transport costs, and barriers to import (eg key infrastructure required).
Financial risk	Leverage	Yellow	Inovyn reported a high gearing ratio in its accounts for year end 2021, and lists “substantial debt” as one of its key business risks. ⁶⁵
	Profitability	Yellow	Although Inovyn and Vynova are profitable, commercial incentives to cease production or exit may not be aligned with needs of critical customers, since direct use for essential uses is a small share of total demand. Profitability is likely to be sensitive to fluctuations in energy prices.
Criticality	Critical input / critical service / essential to end consumer	Red	Both inputs are critical for chemical processes and essential uses, notably water purification (chlorine) and wastewater treatment (caustic soda)
Barriers	Structural	Yellow	High capital cost and long lead times to build new capacity; highly specialised production; decision to enter/expand unlikely to be driven by needs of chlorine or caustic soda customers (essential direct use is a small share of total demand). However, examples exist of relatively recent entry, e.g. a new UK facility in West Thurrock opened in 2013.
	Policy related	Yellow	Wide-ranging regulatory requirements relating to the production of both chlorine and caustic soda.
Demand characteristics	Vulnerable consumers	Green	Not directly purchased by vulnerable consumers.

⁶³ In particular, the Commission cleared a Joint Venture between Ineos and Solvay in 2014. It found no competition concerns in relation to the supply of chlorine in the UK (since Solvay did not have UK manufacturing facilities). However, it did find competition concerns in relation to other products, including the supply of s-pvc across the EU. Thus, as a condition of clearing the merger, it required that Ineos and Solvay divest certain assets; and that the purchaser of those assets enter into a separate JV for the ownership and operation of the Runcorn site. This was so the purchaser of the divested assets had a fully integrated self-standing s-pvc business that could effectively compete against the Ineos/Solvay JV. The purchaser was International Chemical Investors Group (ICIG), which now operates the Runcorn site with Ineos (Solvay having exited the 2014 JV with Ineos in 2016).

⁶⁴ Eurochlor, Chlor-alkali industry review, 2021-22

⁶⁵ Inovyn Limited, Annual report and financial statements, Year ended 31 December 2021

Looking ahead

While there is no apparent immediate risk to supply of chlorine and caustic soda, dependence on a single production site for critical products represents a risk to resilience. The CMA does not have tools to mitigate this risk. Instead, supporting long term resilience in this context is likely to involve a combination of wider measures, with a view to addressing the drivers of fragility highlighted in the framework. These could include:

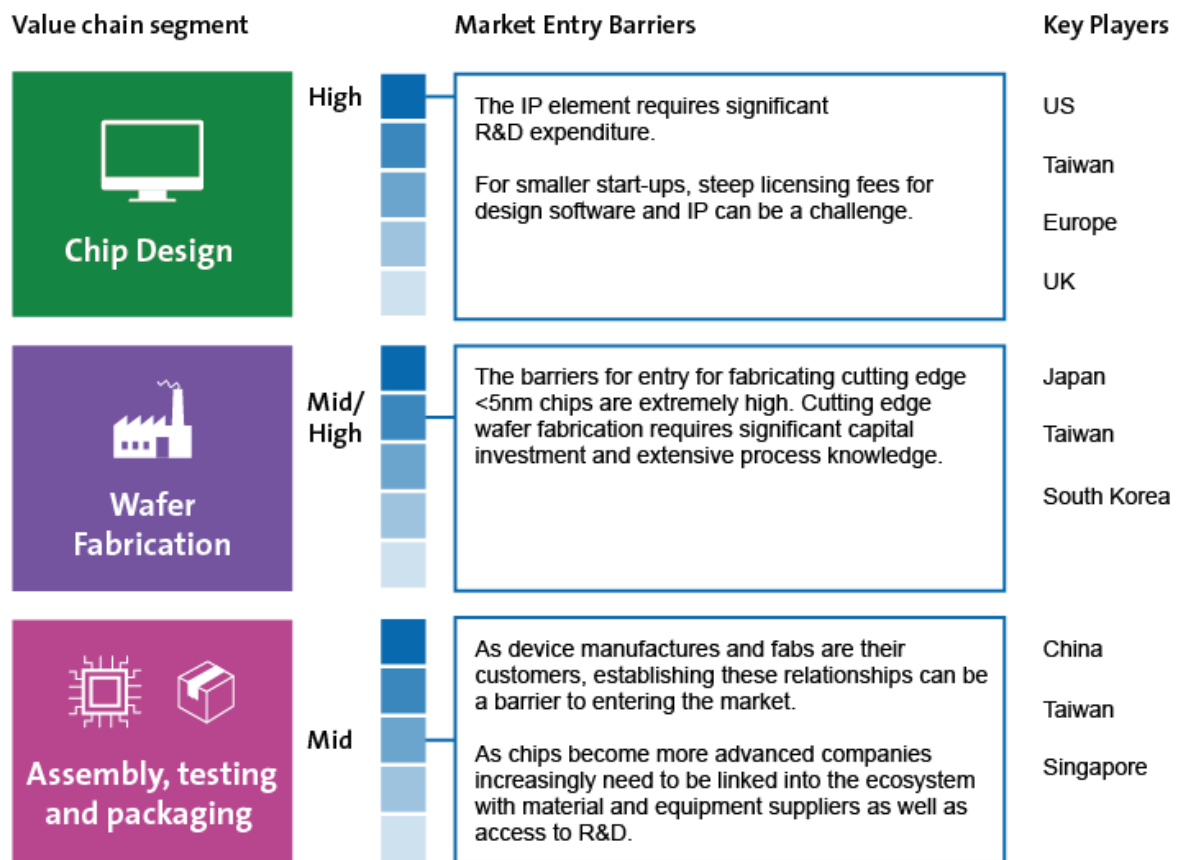
- Strengthening understanding of major suppliers' commercial incentives and profitability, particularly in the context of rising energy costs, and the circumstances under which they would suspend or cease domestic production. This would enable a fuller assessment of the financial risks facing the supply of chlorine and caustic soda.
- Exploring costs of importing packaged chlorine (i.e. for direct use) as an alternative source of supply; whether and how these can be driven down; and if, in an emergency, these could supply all essential needs.
- Strengthening understanding of the demand side, and in particular the substitutability of chlorine and caustic soda for different essential uses over the short-, medium- and long-term, with a view to reducing the criticality of these products for certain uses.
- Assessing the specific barriers that hold back entry or expansion of other domestic suppliers, and the measures that could address these.
- Considering mitigations that could support supply continuity in the event of temporary plant shutdown, e.g. stockpiles.

Some of these measures may be facilitated by systematic market monitoring and oversight, potentially backed by information-gathering powers, which could extend to other parts of the chemicals sector where supply is concentrated in a small number of domestic firms and/or production sites.

Case Study 6: Semiconductors

The semiconductor sector underpins a wide range of industries and applications, from electronic devices, cars, and telecommunication infrastructure, to solar panels, lasers, sensors, medical devices, and defence systems. Demand – particularly for compound semiconductors which are produced from a combination of different materials rather than a single material – is set to increase even further over the coming decades as new technologies and services that depend on these chips – such as autonomous driving, AI and cloud computing – become more widespread.

Figure 2 - barriers to entry across the value chain



Source: adapted from Imagination Tech/Global Counsel, [The future of the UK's semiconductor strategy](#)

However, the markets for advanced semiconductors display a number of features that make supply vulnerable to disruption:

- Barriers to entry in the fabrication (manufacture) of advanced chips are extremely high (see Fig 3, above).⁶⁶
- Relatedly, the fabrication of semiconductors is highly concentrated, both geographically and among suppliers and production facilities. Three countries have a 90% share of the fabrication market,⁶⁷ and for the most advanced chips, one firm in one country – TSMC in Taiwan – accounts for 92% of production.⁶⁸
- Semiconductor supply chains are complex and specialised. Some parts of these supply chains are themselves highly concentrated: for example, companies in the Netherlands and Japan have large market shares in chemicals and equipment used in semiconductor manufacturing.

These features meant that surging demand for semiconductors during the pandemic, combined with disruptions caused by weather events and disasters,⁶⁹ led to long-running semiconductor shortages through 2021 and 2022, with visible and widely reported effects across a range of markets. These shortages, combined with growing anxiety about dependence on a small number of countries and production facilities for such a critical input, together with wider concerns around national security, have led importing economies – the US and EU in particular – to make greater domestic self-sufficiency in semiconductor production a central part of their industrial strategies.

Role of competition policy

In relation to concentration in advanced chip fabrication, although competition authorities can prevent firms from abusing any dominant positions, there is little that they could have done to prevent the current situation, which derives partly from comparative advantage, and partly from historic state support to the semiconductor industry in certain countries.⁷⁰

Since 4 January 2022, a new regime has been introduced to consider transactions, including mergers and acquisitions, with the potential to affect national security. This process, which does not directly involve the CMA, broadens the government's powers to intervene in such transactions on grounds other than

⁶⁶ The cost of a state-of-the-art semiconductor fabrication facility alone is at least \$12bn. Once a new facility is established, operational costs are significant, and ongoing expensive capital investment is required to keep producing cutting-edge chips.

⁶⁷ Imagination Tech/Global Counsel, [The future of the UK's semiconductor strategy](#), May 2022

⁶⁸ Written submission from DCMS to the BEIS Committee inquiry into The Semiconductor Industry in the UK (SEM0080); Stimson Issue Brief, [Semiconductors and Taiwan's "Silicon Shield"](#), 16 August 2022

⁶⁹ In the first half of 2021, a drought in Taiwan caused shutdowns of semiconductor foundries accounting for 63% of global production; a fire shut down a Japanese factory controlled by Renesas Electronics that supplies 30% of microcontroller units (a type of semiconductor used in cars); and power shortages in Texas caused by Storm Uri caused the shutdown of plants operated by NXP and Infineon, two key suppliers to the car industry.

⁷⁰ The development and fabrication of semiconductors has been supported in many cases by state subsidies. For example, TSMC started life as a joint venture between the Taiwan government (which had a 48% stake) and Philips Electronics NV.

their effect on competition, and has already been used on a number of occasions to block or unwind transactions involving firms in the UK semiconductor sector.

Resilience assessment (advanced semiconductor fabrication)

Metric	Sub-metric	RAG rating	Description
Supply diversity	Domestic concentration		Not applicable. UK is dependent on imports.
	Import availability/diversification		High geographic concentration of production ⁷¹ (three countries have a 90% share of the fabrication market, and for the most advanced chips, ⁷² one firm in one country – TSMC in Taiwan – accounts for 92% of production).
Financial risk	Leverage		Major suppliers do not appear to operate with high leverage.
	Profitability		Major suppliers appear to be profitable.
Criticality	Critical input / critical service / essential to end consumer		Critical input for range of products and applications, including consumer electronics, defense, medical devices, data infrastructure.
Barriers	Natural		High capital cost and time intensive to build new capacity; very specialised production.
	Policy related		Various regulatory barriers; but in general, policy is supportive of entry and expansion of domestic suppliers.
Demand characteristics	Vulnerable consumers		Not directly purchased by vulnerable consumers.

⁷¹ The majority of semiconductors entering in the UK are not imported directly, but arrive in the UK as part of an integrated end-use application – for example installed in cars, phones and fridges. (See, for instance, Written submission from DCMS to the BEIS Committee inquiry into The Semiconductor Industry in the UK ([SEM0080](#)))

⁷² Imagination Tech/Global Counsel, [The future of the UK's semiconductor strategy](#), May 2022

Wider government policy

In the UK, a forthcoming semiconductor strategy will set out the government's plans to meet its objectives⁷³ of ensuring a reliable supply of semiconductors; an assured supply of semiconductors for the UK; and protecting and growing UK capability, and seizing opportunities.

In the US and EU, substantial state support is being provided to diversify the location of semiconductor manufacturing facilities. In July, the US Congress passed a CHIPS Act, earmarking US \$52 billion for chip production in the US, through manufacturing grants, research investments, and an investment tax credit. US technology firms that receive funding under the Act will not be able to construct manufacturing facilities in China for a decade.⁷⁴ In the EU, the draft European Chips Act, part of EU's plans to double its current 10% share in the semiconductor market by 2030, is intended to mobilise over €43bn in public and private investment to strengthen research capacity, enhance production capacity and facilitate access to finance for start-ups. Other countries, including India, Japan and South Korea, are also planning state support to promote domestic semiconductor manufacturing.⁷⁵

Looking ahead

The UK's strengths lie in semiconductor design, compound semiconductors and research, rather than in advanced wafer manufacturing. With barriers to entry in this part of the sector so high, and supply chains so complex, new sources of domestic production are likely to provide only a small part of the answer to fragility of supply. A combination of levers – including carefully targeted industrial policy and trade policy – are likely to be necessary to support greater resilience in this sector.

Further afield, while US support to the semiconductor sector is manifesting itself in new production facilities,⁷⁶ it is likely that for the most advanced chips, including those that power some of the latest consumer electronics, dependence on Taiwan as a source of supply will continue for the foreseeable future.⁷⁷

⁷³ Written submission from DCMS to the BEIS Committee inquiry into The Semiconductor Industry in the UK ([SEM0080](#))

⁷⁴ The US has also implemented increasingly wide-ranging restrictions on the export of semiconductors and chip-making equipment to China.

⁷⁵ BEIS Committee, [The semiconductor industry in the UK, Fifth Report of Session 2022-23](#), HC291, 28 November 2022

⁷⁶ See, for example, AZ Central, [Taiwan Semiconductor announces 2nd factory during Biden visit. Company plans \\$40B investment](#), 6 December 2022

⁷⁷ TSMC's first factory in Arizona – due to come online in 2024 at an estimated cost of \$12bn – will not be capable of producing the chips that power the latest iPhones (see for example, [Stratechery](#),

Case Study 7: Adult and children's care

Adult social care caters for older people, people recovering from hospital stays, people living with a physical or learning disability, people suffering from chronic health conditions.

In the 2000s, the sector became a target for private equity, leading to a growth in leveraged capital structures. It was excessive financial risk that led, in 2011, to the failure of Southern Cross, the UK's largest social care provider at the time, putting 31,000 care home residents at risk of eviction.⁷⁸ In the end, the homes operated by Southern Cross were transferred to a number of other providers. But an independent report commissioned by the Care Quality Commission considered that the rescue was a "close run thing", and that had another provider failed around the same time, it may not have been possible to ensure continuity of care for residents.

Following this incident, the UK government legislated for a market oversight regime in England, under the Care Act 2014, to monitor the financial viability of large and significant providers in this sector, and to forewarn local authorities on the risk of similar provider failure in the future.⁷⁹ Providers who are subject to the oversight regime, are required to submit different categories of financial and other commercial information to the Care Quality Commission (CQC).⁸⁰ CQC has a duty to notify local authorities, should financial sustainability risks become significant.

The children's social care sector has parallels with adult social care, both in terms of the vulnerability of those who rely on it, and in the growth of private equity ownership.

The role of competition policy

The CMA has undertaken market studies into both [children's social care](#) (2021) and residential [care homes for the elderly](#) (2017). Both were motivated by questions around the future financial sustainability of care services, in the context of growing demand, together with concerns about the quality and availability of services to those who depend on them. In the case of children's care, resilience concerns principally related to the absence of monitoring of the financial health of suppliers, and lack of planning for potential failure. For adult social care, which already had market monitoring arrangements in place, concerns centred on the adequacy of funding for state-funded residents, and consequent lack of profitability in this part of the market. These studies led to a number of recommendations to governments and local authorities across the UK, including to improve the financial resilience of these sectors, summarised below.

⁷⁸ Following its acquisition by a private equity company, Southern Cross sold and leased back its property portfolio under an arrangement that involved high annual rental increases. It thereby became highly leveraged, and less resilient to changes in trading conditions. When the occupancy rates of its homes fell unexpectedly, it was unable to absorb the associated loss in revenue.

⁷⁹ [Market Oversight of 'difficult to replace' providers of adult social care: quick guide - Care Quality Commission](#)

⁸⁰ Ibid.

Resilience assessment (children’s social care)

Metric	Sub-metric	RAG rating	Description
Supply diversity	Supply diversity – domestic concentration	Yellow	A large number of providers operate in the market, although the need to obtain specialist provision within a reasonable distance can limit choice to a small number of providers in practice.
	Supply diversity – import availability/dependency	Grey	Not applicable.
Financial risk	Financial risk – leverage	Red	Some of the largest providers operate with high levels of leverage.
	Financial risk – profitability	Green	Profitability is high, driven by growing demand from local authorities
Criticality	Critical input / critical service / essential to end consumer	Red	Essential service.
Barriers	Barriers to entry/or expansion - natural	Yellow	Not capital intensive, but there are supply side constraints (including the availability of appropriate properties, and recruitment and retention of appropriately skilled staff).
	Barriers to entry/or expansion – policy related	Yellow	Some regulatory barriers to entry and expansion arising from the registration and inspection regime, and the planning system.
Demand characteristics	Vulnerable consumers	Red	Sector serves some of the most vulnerable children.

The role of government policy

Both of the CMA’s market studies highlighted the influence of local and national government on resilience, through their approach to procurement, and through their oversight of the market.

In respect of residential care for the elderly, the CMA concluded that the statutory market oversight regime in England mitigated risks to supply continuity arising from providers operating with high leverage.⁸¹ Instead, concerns regarding financial resilience were focused on the profitability of state-funded placements in residential homes, which the study concluded was insufficient to sustain the current model of service provision. In particular, the rates paid by local authorities were found to be insufficient to attract investment required to meet growing future care needs. Among other things, the CMA recommended enhanced planning of future care needs at local level, together with greater assurance at national level about future funding levels.

In respect of children’s social care, the high leverage of some of the largest private providers was found to create a risk of disorderly failure that could disrupt the placements of children in residential care. The CMA recommended a market oversight regime analogous to that in place for adult social care. The study also considered the role of local authorities, as the principal buyers of children’s care services, and found that a fragmented approach to purchasing led to a shortfall in appropriate places. In response, the CMA made a series of recommendations for the government to support LAs adopt better co-ordinated, collective

⁸¹ The study did recommend mechanisms be established to share critical information and market intelligence between the relevant national regulators and other bodies in the UK’s four nations to facilitate continuity of care for residents.

forecasting, procurement, and commissioning practices, and to remove regulatory barriers to create new capacity.

Looking ahead

In the context of growing demand pressures, monitoring and supporting the resilience of both adult and children's social care markets will remain important as ever. In the context of residential care for the elderly, it will be particularly important to ensure the market is in a position to deliver the additional capacity required to meet expected future needs. In its White Paper on social care,⁸² the government has committed to strengthening English local authorities' capabilities to oversee and shape care markets, together with increased funding to enable LAs to pay providers a "fair rate for care". In respect of children's social care, the UK government announced that it was accepting all of the CMA's recommendations in February 2023.

⁸² [People at the Heart of Care: adult social care reform - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/white-papers/social-care-reform)

4. Supporting resilient markets – the role of the CMA

Overview

30. The CMA's statutory duty is to promote competition for the benefit of consumers. The promotion of competition is in general supportive of market resilience. Most significantly, it can help to promote supply diversity, which can improve resilience for the reasons set out in paragraph 16 and illustrated by the case studies in Section 3. In order to benefit consumers, competition needs to work in their interests. In certain cases, the CMA's work to promote competition can also address other market features that are associated with fragility – such as financial risk – where this can be shown to make competition weaker or less beneficial for consumers.
31. The CMA has a number of powers and functions that it uses to meet its statutory duty. However, the law sets out certain limits on when and how these can be used. This section explores in more detail how the CMA, through the exercise of its powers and functions, can support resilience. In general, the CMA's powers and functions are likely to be more effective in preventing markets developing in ways that may undermine resilience, than they are in addressing pre-existing resilience problems.

Merger review

32. Merger review in the UK is primarily the responsibility of the CMA. The aim of the CMA's merger review is to ensure that mergers do not substantially lessen competition. In doing so, the CMA will consider the effect of a merger on rivalry over time in the market or markets affected by it. If, following an in-depth "phase 2" investigation,⁸³ the CMA decides that a merger gives rise to a substantial lessening of competition (SLC), it can prohibit the merger, or take other steps to remedy the effects on competition.
33. The CMA may intervene to prevent a merger increasing concentration in a market if it considers that this will substantially lessen competition. A consequence of the CMA's competition-focused intervention may also be that such interventions also preserve diversity of supply in the affected markets: that is, they can prevent markets becoming so concentrated as a result of mergers and acquisitions that resilience is compromised. Merger review can also, in certain cases, prevent a firm acquiring control of a key upstream input, particularly if it has incentives to restrict access to its downstream

⁸³ The process of merger review, including the CMA's Phase 1 and Phase 2 processes, are explained in [CMA18 – A quick guide to UK merger assessment](#)

competitors. Preventing such mergers can have the effect of enhancing supply chain resilience in particular.

34. However, merger review is a marginal assessment, which considers the additional competition impact of the transaction in question. It cannot, therefore, act to prevent or correct a loss of supply diversity when this arises other than as a consequence of a merger: for example, through a company naturally growing its market share to a very high level, or the strategic exit of firms involved in domestic production. The CMA's role is only to consider the competitive effects of a transaction; the CMA does not consider broader policy issues with respect to foreign investment and foreign ownership. The CMA would only intervene in a foreign takeover of a UK company – even in a market that has limited supply diversity – if that takeover raised competition concerns in the UK.
35. CMA merger assessments have to date contained relatively limited explicit consideration of the possibility that a merger may lead to an increased risk of supply disruption. This partly reflects the nature of the interaction between the causes of market fragility and competition issues. In particular:
- In respect of supply diversity – although the CMA does not apply any thresholds to market share, or number of remaining competitors, to determine whether a loss of competition is substantial – it would normally be expected that 'traditional' concerns around competition⁸⁴ would be triggered at a lower level of market concentration than concerns about the undermining of resilience.
 - In respect of other causes of fragility – particularly financial risk – demonstrating that a merger could lead to an SLC to the standard required to intervene would be challenging.⁸⁵ For example, in respect of a leveraged acquisition that led to a rise in financial risk, the CMA would have to demonstrate that the levels of debt being taken on as a result of the acquisition were such that the target would be likely to fail post-merger, or at least that its financial position would be affected to such a degree that it would become a significantly weaker competitor (for example, because it would not be able to make significant investments of the kind needed to continue to be an effective competitor). It will often be difficult to assess at the time of a merger whether gearing will affect a target's competitiveness (and over what time frame).

⁸⁴ That is, concerns about a merger leading to an increase in prices, or a deterioration in quality, range or service level.

⁸⁵ At Phase 2, the CMA decides whether the merger is more likely than not to lead to an SLC (that is, on the 'balance of probabilities').

36. Where resilience is a concern in a market, or where it affects the competitive process, it may be reflected directly in the CMA's merger analysis: For example:
- Where security of supply affects customer purchasing decisions, it may be relevant to market definition. In late 2022, the CMA considered the merger of the two largest UK suppliers of chemical admixtures.⁸⁶ These are an essential input for products like concrete and cement used in the construction industry. The CMA defined the geographic market for this merger as UK only, and concluded that overseas suppliers would not exert a material competitive constraint on the merged firm. This was based in part on submissions from customers that imports of chemical admixtures could not be relied on because of concerns about security of supply; and relatedly, that delays to imports would cause unacceptably high costs. This assessment was further supported by trade data showing that only around 20% of consumption in the UK was met by imports in 2019, and input from competitors on the costs of transporting chemical admixtures.
 - Where suppliers compete on the resilience they can provide to customers, a reduction in competition in the market could lead to a worsening in the level of resilience offered by individual suppliers which could in turn lead to reduced resilience across the market. In 2016, the CMA considered the merger of two largest suppliers of aircraft de- and anti-icing fluids (ADF) in the UK. Evidence showed that customers attached a high importance to supply resilience of ADF, and particularly the ability of suppliers to deliver on time in difficult weather conditions: that is, the resilience of individual suppliers was a key factor in determining customers' choice of supplier.⁸⁷ In its provisional conclusion that the merger would result in a substantial lessening of competition, the CMA noted that this reduction in competition could lead the merged entity to offer less security of supply (because the merged company would no longer face the same competitive pressure to maintain high standards in this part of their service offering). It provisionally concluded (among other things) that the merged business "would have an incentive to increase prices and/or worsen non-price aspects of its offering (including security of supply)."⁸⁸
 - Where the CMA's intervention in a merger preserves diversity of supply, it may also preserve resilience in the market or markets affected by the

⁸⁶ [Sika AG / MBCC Group merger inquiry - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/sika-ag-merger-inquiry)

⁸⁷ Supply disruption of aircraft de-icer has previously led to widespread groundings of flights – see, for example, Financial Review, De-icer shortage threatens flights, 31 December 2010

⁸⁸ [Clariant / Kilfrost merger inquiry - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/clariant-merger-inquiry)

merger. Although it did not explicitly consider resilience and the possibility of supply disruption, the CMA's assessment of NVIDIA's anticipated acquisition of Arm in 2021 found that, if the transaction proceeded, the merged company would have the ability and incentive to restrict access to Arm's semiconductor intellectual property (IP).⁸⁹ For these downstream companies, this intellectual property was a critical input, owing to the difficulty of switching IP licensor and the limited availability of alternatives.

Merger control in a crisis.

37. The pressures created by crises, including those involving supply disruption, often lead to struggling firms merging or being acquired. The highest acquisition prices for shareholders of such firms often come from a target's closest competitor. However, acquisitions by close competitors are more likely to raise competition issues.
38. The CMA continues to be responsible for reviewing whether mergers are likely to reduce competition in times of crisis. Its merger assessment guidelines⁹⁰ set out the framework it uses to review mergers involving a firm that may otherwise exit a market. Where the CMA concludes that the firm is likely to have exited (through failure or otherwise), it considers whether there are alternative, less anti-competitive purchasers for the firm or its assets.
39. Mergers may also appear to be an attractive solution to policymakers faced with an industry in distress, where supply is at risk. Paragraphs 63 to 65 consider the implications of government relaxing merger control to address risks to supply disruption caused by failing firms.

Market studies and investigations

40. The CMA's market studies and investigations (together, its "markets tools"), allow it to consider how markets are functioning as a whole (rather than the conduct of particular firms), and take steps to address issues across an entire market. In particular:
 - Market studies may lead to a range of outcomes, including recommendations to the government and other public authorities on regulation and policy. However, the CMA does not have powers, on the basis of a market study alone, to directly address any problems that it finds.

⁸⁹ NVIDIA / Arm merger inquiry - GOV.UK (www.gov.uk)

⁹⁰ Paras 3.21-3.38

- If the CMA identifies an AEC, it must consider whether and how this should be remedied, including whether to order legally-binding remedies. Such remedies can include requiring firms to sell parts of their business to another company (divestment), or removing obstacles to competition, such as impediments to customer switching, or barriers to entry and expansion.
41. Unlike merger assessment, the CMA's markets tools can in principle help to address "pre-existing" resilience issues across a whole market (as opposed to those arising from the effects of a particular transaction). In particular, to the extent that fragility – and the market features associated with it – can be shown to harm consumers and competition, the CMA can in principle seek to remedy this through its markets tools, whether through recommendations or (following a market investigation) binding remedies.
 42. Previous markets work where resilience considerations have featured includes market studies into audit services (see Case Study 3) and children's social care (see Case Study 7). In both cases, concerns about market resilience – caused by lack of supply diversity (in the case of audit) and financial risk (in the case of children's social care) – motivated recommendations to government on regulatory reform.
 43. There are a number of further situations in which resilience considerations could, in principle, form part of the CMA's assessment in a market study or investigation. Some hypothetical examples of these are considered below. These examples are illustrative and are not intended to reflect any change in approach taken to the CMA's market studies and investigations.
 - Where firms supply essential goods and services, they can become too important to fail (TITF). This may particularly be the case where markets are concentrated, where there are barriers to entry or expansion, or where there are vulnerable consumers. In these cases, the failure of a single firm can cause significant disruption. The CMA may consider these features to be harmful to consumers and/or competition as part of a market study or investigation: for example, TITF firms may face barriers to exit that allow them to operate inefficiently (relative to competitors) while maintaining their position, and may incentivise excessive commercial, compliance and other risk-taking (the moral hazard problem). In such circumstances, we may consider recommending measures that help to address the TITF problem, such as special administrative regimes, or requirements around financial resilience.
 - Where imports are unreliable, this can harm consumers and/or competition. This is particularly the case in markets that exhibit other

fragile features (for example, concentrated domestic production and financial risk), and where amplifiers of harm are present, such that the adverse effects of disruption are likely to be greater. In such circumstances, we may consider recommendations to support a reliable flow of imports and/or to improve resilience of domestic supply (for example, stockpiling or incentives for domestic production).

- Competition itself may operate in such a way that leads to levels of market resilience that are suboptimal for consumers. For example, competition between firms may focus on price to such an extent that they operate with low levels of financial resilience or limited spare capacity, leading to frequent supply disruption. If the harm from this disruption was judged to exceed the benefit consumers obtained from lower prices, this could lead to recommendations or other remedies to help ensure firms operated in a more resilient way, and could exit the market without undue harm to consumers. The objective of such recommendations would be to mitigate disruption and consumer harm, rather than to prevent the failure of inefficient firms, which is an important part of the competitive process.

44. Although the CMA's markets tools provide a reasonably flexible basis to address resilience issues where they can be shown to harm consumers and/or competition, there are a number of limitations:

- Many of the measures that might support market resilience are likely to be most effectively implemented by government or other regulators (see Section 5). In such cases, the CMA may recommend measures to support resilience following market studies and investigations, but it would fall to others to take the action necessary to give these measures effect.
- The CMA may through binding remedies take direct action to support resilience (to the extent that a lack of resilience derives from an adverse effect on competition that can be remedied by imposing orders on the companies involved). However, market remedies do not, provide a basis to address urgent risks to supply continuity. They can only be applied after a market investigation has been completed (statutory timeframe 18 months) and are legally appealable decisions.
- Market studies and investigations are substantial and resource-intensive pieces of work. The CMA is limited in the number of such pieces of work it can carry out, and it must prioritise those that are likely to have the greatest impact for people, businesses and the economy.

Competition act enforcement and business co-operation

45. The CMA is the primary enforcer of competition law across the economy. Among other things, competition law prevents anti-competitive agreements between firms. Market shocks can provide cover for such agreements, which are often more easily sustained in concentrated markets. For example, an emergency or a disaster may naturally lead to temporary price rises, caused by rapid changes to demand and/or supply. But firms may co-ordinate to sustain those high prices even after crisis conditions recede, turning a price spike into a high plateau. By stopping and deterring such agreements, the CMA's enforcement of competition law can thus help to mitigate the extent and duration of harm from supply disruption, thereby supporting market resilience.⁹¹
46. In some cases, supply disruption, or the potential for it, can mean there is a role for certain forms of legitimate business co-operation. For example, in the context of a shortage, firms in a market may wish to co-ordinate to ensure supply continuity across the country and fair distribution of scarce products. There are a number of ways in which such co-ordination can be facilitated:
- the CMA can decide not to prioritise enforcement against certain forms of co-operation – for example, where it supports supply continuity without harming consumers;⁹²
 - section 9 of the Competition Act 1998 automatically exempts certain agreements and arrangements restricting competition – including those that contribute to improving production or distribution – provided they meet certain conditions. The CMA may issue guidance on how the exemption may apply in specific circumstances, including in the context of supply disruption.⁹³
 - the government, through secondary legislation, may exempt certain types of co-operation in specific sectors from competition law. Such exemptions and their implications are discussed in paragraphs 61 to 63.
47. In general, at times of crisis, the CMA will remain open to providing guidance on how competition law operates, so that firms are not unduly impeded from co-operation that supports market resilience.

⁹¹ In the context of disruptions, the CMA joined forces with four other major competition authorities in February 2022 to share intelligence on anticompetitive behaviour and collusion in global supply chains. ([International agencies put supply chains on notice against collusion](#))

⁹² For example, during the COVID-19 pandemic, the CMA issued [guidance](#) (since withdrawn) that it would not take enforcement action against certain temporary forms of business co-operation.

⁹³ Ibid.

48. Competition law also prevents firms from abusing a dominant position in a market. Abuses of dominance can have the effect of reducing resilience both in markets in which the firm in question operates (for example, predatory pricing, which can prevent entry and expansion of competitors, thereby limiting supply diversity), and in downstream markets (for example, by locking customers into exclusivity agreements, thereby reducing their ability to seek alternative sources for key inputs).

5. Supporting resilient markets – wider policy levers

49. The case studies in Section 3 help to illustrate how policies and decisions by government and regulators can affect resilience. Sometimes these effects are intentional: for example an explicit objective of the government's 5G Diversification Strategy is to "attract new suppliers into the UK market to build resilience and competition".⁹⁴ In other cases, such as the high weighting of price in tender evaluation for forensic services, the pursuit of a different policy objective (in this case, cost minimisation) had unintended consequences for market resilience. This section sets out some of the most relevant policy areas, and explains their interaction with market resilience and the features of the framework.
50. Whether proactive policy intervention is necessary in the first place depends on whether a market is delivering an appropriate level of resilience, both from the perspective of customers and wider society. The framework in Section 2 can help to identify those markets where this may be the case, and where intervention may be required.
51. In many cases, the insufficiency of market forces alone to deliver appropriate levels of resilience is already well recognised, and measures are in place that aim to prevent supply disruption. In the utilities sectors, for instance, regulation to promote resilience is especially important because supply diversity – in the form of, for example, parallel water and energy networks – is often unfeasible or highly inefficient. In financial services, meanwhile, the spillover effects of fragility – starkly illustrated by the 2008 financial crisis – have prompted wide-ranging reforms to improve the financial and operational resilience of banks, and other systemically important institutions, and to ensure that failing firms can exit the market in an orderly way.
52. In general, as the case studies in Section 3 illustrate, competitive, well-functioning markets and resilience are closely intertwined, and policy interventions that support competition are likely also to promote market resilience. Conversely, measures that distort competition (for example, permitting anticompetitive mergers, or subsidising domestic production to achieve self-sufficiency) – while often carried out with the intention of supporting resilience – may undermine it over the longer term.
53. With this in mind, this section discusses some of the policy areas most relevant to market resilience. The table at the end of this section provides a more detailed list of specific interventions that have been used in the past to

⁹⁴ 5G Supply Chain Diversification Strategy - GOV.UK (www.gov.uk)

prevent or respond to supply disruption, and an indicative assessment of their risks to competition.

Procurement policy

54. Government is a dominant buyer in a number of markets. For many of these markets, resilience is a priority because disruption can affect the delivery of essential public services. Instability in the forensic services market (see Case Study 3), and disruption following the collapse of Carillion, underscore the risks of dependence on a small number of suppliers, and the role of government in influencing the market features that are associated with fragility.
55. Through its approach to purchasing, government can support market resilience by promoting supply diversity, supporting the financial resilience of its suppliers, and lowering barriers to entry and expansion. The importance of this role is reflected in the [Cabinet Office's Sourcing Playbook](#), a cross-government guide to the delivery of public services in partnership with the private and third sectors. For certain procurements, the Playbook advocates:
- Market health assessments, to identify weaknesses (including lack of supply diversity) that might affect the ability of the market to reliably deliver critical goods and services, and to help ensure commercial strategies and contracts are designed in a way that promotes a resilient and competitive supplier base.⁹⁵
 - Assessment of the economic and financial standing of prospective suppliers to determine their financial ability to perform contracts.
 - Resolution planning for suppliers of critical public services so that government is prepared for any risks to continuity of service provision posed by the insolvency of critical suppliers. This is expected to include ongoing financial monitoring of such suppliers.
56. The CMA supports the measures set out in the Playbook and encourages public procurers to develop a deep understanding of the markets from which they are sourcing essential goods and services, and adopt commercial strategies that promote market health and resilience over the short, medium and long term.

⁹⁵ The Cabinet Office Market Management guidance note, produced in conjunction with the CMA, contains guidance on when and how to monitor market health, and how to promote healthy markets

Regulation

57. Regulatory intervention is widely used in a range of markets to support resilience and can in principle affect all the market features in the framework.
- Regulation can promote **supply diversity**: for example, by tackling impediments to customer switching, and/or by setting requirements that help to manage and mitigate market power (e.g. open data standards and interoperability).
 - Regulation can prevent firms operating with excessive **financial risk**, for example by setting capital and liquidity requirements, and/or require firms to submit information to enable financial monitoring and oversight of a market. It can also set requirements to support resilience to other operational risks that might cause supply disruption (e.g. cyber attacks).
 - Regulation can affect whether and **how far a good or service is essential**. For example, regulation introduced after the financial crisis to require certain contracts to be cleared through central counterparty clearing houses have made these firms more critical parts of the financial system. Regulatory requirements for certain professionals to have indemnity insurance make these services essential.
 - Regulation can lower or raise **barriers to entry and expansion**, and at times of crisis, decisions to relax regulatory requirements, or expedite processes, can help to assist firms to enter and expand to meet shortfalls in supply.
 - Regulation may afford special protection to **vulnerable consumers** at times of supply disruption, or prevent suppliers from ceasing to serve them on commercial grounds. For example, the nine largest personal current account providers are legally required to offer basic bank accounts that are fee-free for standard operations.
58. In certain cases, regulation can negatively affect resilience. For example, regulation can reduce diversity by making it harder for certain types of business (e.g. smaller firms, or those with alternative business models) to compete, or by directly limiting the number of firms in a market.

Legislative changes to the competition regime

59. Although the CMA is the primary body responsible for competition law enforcement and merger control, it is government and parliament that sets the legal framework in which the CMA operates. At times of crisis, and particularly where supply continuity of essential goods and services may be at risk,

government may seek to amend elements of this framework with the objective of ensuring resilience. The CMA makes no general recommendations as to the merits of such changes, although some considerations and risks are set out below.

Relaxation of rules on anti-competitive agreements

60. Under competition law, the Secretary of State can make secondary legislation to relax UK competition rules for certain agreements that might normally be considered anti-competitive. This is known as a ‘public policy exclusion order’. Exclusion orders have in the past been made at times of crisis to enable firms to co-ordinate to ensure continuity of supply of essential goods and services.⁹⁶
61. Depending on their scope, duration, and the conduct they permit, exclusion orders can carry risks. In particular, they create conditions that facilitate co-ordination and the exchange of information between firms, which may go beyond what is permitted under the exclusion and persist beyond the duration of the order. Where short-term co-ordination turns into behaviour that illegally shields firms from competitive pressure over the longer term, this can harm competition, consumers and resilience.
62. The CMA has previously advised the government on the design and scope of exclusion orders to help mitigate these risks. In particular, it is important that exclusions from competition law are short-term in nature; that they go no further than is strictly necessary to ensure supply continuity; and that their impact and necessity is continuously reviewed, so that they can be withdrawn at the earliest opportunity to restore normal competitive conditions.

Changes to merger control

63. While the CMA reviews mergers independently on competition grounds, the Enterprise Act enables the Secretary of State – through secondary legislation – to introduce new “public interest” considerations into statute, allowing them to intervene so mergers can be considered on grounds other than the impact on competition. In cases where these specified public interest considerations are potentially relevant, the Secretary of State makes the final decision on whether to allow a merger, on the basis of advice from the CMA regarding

⁹⁶ For example, during the pandemic, exclusion orders were made in the groceries, ferry transport, dairy and healthcare sectors. More recently, an exclusion order was made in relation to the supply of CO2.

both the competition and public interest implications.⁹⁷ In some cases, public interest considerations relating to resilience have been introduced, in particular with respect to public health emergencies and the stability of the financial system, that would allow the Secretary to permit anti-competitive mergers, and conversely, to block mergers that would otherwise be allowed to proceed on the grounds of public interest.

Creating exemptions to allow anti-competitive mergers to proceed

64. Where policymakers are faced with an industry in distress, allowing mergers and acquisitions may appear to be an effective means to preserve continuity of supply. For example, the merger between Lloyds TSB and HBOS at the height of the 2008 financial crisis was enabled through a relaxation of merger control, so that the transaction could proceed in the face of what were significant competition concerns.⁹⁸ As well as harming competition, by creating an entity with a retail current account market share exceeding 30%, the intervention was arguably ineffective on resilience grounds: weakened by the acquisition, Lloyds required £20bn in government support.⁹⁹ More generally, anti-competitive mergers can have a lasting impact on market structure that cannot easily be unravelled when crisis conditions subside. From a policy perspective, for firms facing failure that governments wish to protect for public policy reasons (for example, because their exit would be harmful to customers or the wider economy), a well-designed package of temporary financial assistance is likely to be preferable to permitting an anti-competitive merger.
65. Although this has not been a feature of UK merger control, relaxation of merger rules may also be considered by governments looking to create “national champions”. As set out below, arguments for national champions are often framed in terms of the resilience and self-sufficiency benefits that such firms are supposed to bring.¹⁰⁰ However, replacing dependence on overseas

⁹⁷ The three public interest considerations on which Ministers can currently intervene in merger cases are media plurality, stability of the UK financial system, and mitigating effects of public health emergencies. Further information on the CMA’s role in respect of public interest cases can be found in [Mergers: guidance on the CMA’s jurisdiction and procedure, CMA2](#)

⁹⁸ [OFT Report to the Secretary of State for Business Enterprise and Regulatory Reform on the Anticipated acquisition by Lloyds TSB plc of HBOS plc, 24 October 2008](#) In reaching its conclusion, the OFT considered whether the counterfactual – that is, the competitive situation in the absence of the merger – needed to be adjusted to reflect the potential failure of HBOS were the merger not to proceed. It considered that the counterfactual did not need to be adjusted in this way, on the grounds that “it is not realistic to consider that HBOS would have been allowed to fail”.

⁹⁹ House of Commons Library Briefing Paper 5748, [Bank rescues of 2007-09: outcomes and cost](#), 8 October 2018

¹⁰⁰ For example, after the European Commission blocked the merger of Siemens and Alstom, two of Europe’s largest firms in the rail industry, there were calls for EU merger control to be relaxed in order to allow such transactions to proceed in future.

suppliers with dependence on a nation champion created through an anti-competitive merger is unlikely to be resilience- or efficiency-enhancing.

Industrial policy and onshoring

66. Dependence on imports for essential goods and services is often used as an argument for “onshoring” – that is, to initiate or increase domestic production, usually with the help of government subsidies and tax incentives.¹⁰¹ Shortages and supply chain disruptions during and after the Covid-19 pandemic, together with growing concerns about the reliability of major import partners, have led to renewed focus in a number of countries on achieving a greater degree of self-sufficiency through domestic production. The promotion of resilience in this context is often bound up with wider industrial policy objectives to protect and support certain industries deemed to be strategically important. For example, as part of its strategic autonomy agenda,¹⁰² the EU is looking to increase its share of the global semiconductor market from 10% to 20%, including through financial support to set up factories for advanced chip production.¹⁰³
67. From a resilience perspective, such support may help to address risks that arise from dependence for critical goods on imports from unreliable sources, and where regulatory intervention cannot (at least on its own) address the cause of fragility: that is, they can improve supply diversity by adding or expanding domestic sources of supply. However, a number of considerations are likely to be relevant to the appropriateness and potential effectiveness of supporting domestic production to promote resilience.
- Decisions over where and how to allocate support may reflect the interests of firms (often large incumbents) and sectors that stand to benefit, rather than genuine resilience concerns. In general, support for domestic production should be focused on areas where undiversifiable import vulnerabilities exist for critical products, keeping in mind that, in many cases, global supply chains can be a source of both resilience and

¹⁰¹ Such support is normally required to bring domestic production costs down to a level at which firms can compete with overseas suppliers, and/or to incentivise necessary capital investment.

¹⁰² EU strategic autonomy refers to the capacity of the EU to act autonomously – that is, without being dependent on other countries – in strategically important policy areas. Since the Covid-19 pandemic, the focus of strategic autonomy has shifted to mitigating economic dependence on foreign supply chains.

¹⁰³ European Parliament briefing, [Strengthening EU chip capabilities – how will the chips act reinforce Europe’s semiconductor sector by 2030?](#)

efficiency for firms, and of greater choice and lower prices for consumers.¹⁰⁴

- While such policies can increase domestic supply, they can also lead to additional production being concentrated in a single firm: indeed, in the case of measures to promote "national champions", this is often the policy intention. Although it may serve other policy objectives, replacing dependence on overseas suppliers with dependence on a single domestic producer (particularly one that may, by virtue of its position and the support it has received, be too important to fail) may reduce supply diversity and thereby worsen resilience. To the extent that it shields firms from normal competitive forces, support to onshore production is also likely to harm long-run growth and productivity.
- Supply chain dependencies and complexities mean that onshoring one part of a chain may not significantly increase overall resilience. For example, onshoring semiconductor manufacturing may still leave a country dependent on overseas supply for inputs – such as gases and chemicals – that are essential to chip production.¹⁰⁵

68. Leveraging the UK's economic strengths whilst deepening economic relationships with reliable import partners is likely to be preferable – from a resilience and efficiency perspective – to an approach focused solely on onshoring and national champions.

¹⁰⁴ See, for instance, D'Aguanno et al (2021), Global value chains, volatility and safe openness: is trade a double-edged sword? Bank of England, Financial Stability Paper No.46; OECD (2021), Global Value Chains. Efficiency and Risks in the Context of COVID-19; and Miroudot (2020). Resilience versus Robustness in Global Value Chains: Some Policy Implications

¹⁰⁵ BCG has estimated that for the US to achieve complete manufacturing self-sufficiency in semiconductors would require over \$400bn in government incentives and cost more than \$1tn over ten years. ([Strengthening the global semiconductor supply chain in an uncertain era](#), April 2021)

Trade policy

69. Trade policy can help to diversify sources of overseas supply, thereby promoting market resilience. This can include unilateral or negotiated reduction of trade barriers, international partnerships, and measures to enable and support firms to diversify their overseas supplier base. Trade defence measures can also stimulate diversity of supply where domestic producers are harmed by unfair trade practices abroad, and might otherwise exit the market (resulting in over-dependence on imports).

The government's supply chain resilience framework

As part of the UK government's work to improve the resilience of critical supply chains, the Department for Business and Trade has developed a resilience framework which highlights five areas to be explored when reducing dependencies in supply chains:

- diversification – identify alternate source of supply to create flexibility in the supply chain
- international partnerships – work with international partners to identify common challenges, bring down barriers to trade and strengthen the resilience of international supply chains and systems
- stockpiling and surge capacity – identify whether it may be beneficial to hold stocks and strategic reserves of components or goods and consider whether surge capacity can be included in contracts
- onshoring – identify whether increasing or expanding domestic capacity might be helpful in reducing risks
- demand management – identify whether it may be beneficial to manage the demand for components or goods, considering substitutes and alternatives, innovation, and circularity

Policy interventions of relevance to market resilience

Measure	Preventative (P) or remedial (R)? ¹⁰⁶	Examples	Relevance to market resilience (with reference to framework where applicable)	Potential risks to competition
Regulatory measures				
Special administration regimes/resolution regimes	R	Retail energy, banking, water, further education, social housing	Mitigates the disruption caused by firm failure (insolvency) by helping to ensure continuity of supply. ¹⁰⁷ In particular, helps address too-important-to-fail problem arising the combination of essential goods/services, financial risk and (in some circumstances) concentration . Could also, in principle, mitigate against the concentration that arises when the assets and clients of a failed firm migrate to remaining incumbents. ¹⁰⁸	Medium: failed firm may benefit from support during its time within the regime that distorts competition. If, as a way of exiting the regime, the failed business is sold to a large incumbent, this is likely to increase market concentration.
Supplier of last resort	R	Retail energy	Mitigates the disruption caused by firm failure by helping to ensure continuity of supply. In particular, helps address too-important-to-fail problem arising the combination of essential goods/services, financial risk and (in some circumstances) concentration .	Medium: can materially increase market share of “last resort” suppliers, which are more likely to be larger in the first place.
Mandatory living wills/contingency	R	Payment services providers	As above	Low (though potentially burdensome for smaller firms).

¹⁰⁶ Preventative (P) indicates that the measure generally helps to prevent, or reduce the risk of, firm failure and/or supply disruption. Remedial (R) indicates that the measure generally helps to mitigate the effects arising from firm failure and/or supply disruption.

¹⁰⁷ The “standard” insolvency regime places greater emphasis on maximising distributions to creditors (and then shareholders) over other outcomes such as ensuring the resilience of the market.

¹⁰⁸ See, for instance, CMA [Audit market study – final report](#), Section 7

plans/wind down planning		Children's social care (recommended by CMA market study)		
Reverse stress testing requirements ¹⁰⁹	P	Certain investment firms regulated by the FCA	Enables firms and regulators to plan for and mitigate supply disruption risks arising from "known unknowns".	Low (though potentially burdensome for smaller firms).
Mandatory simulated attack testing	P	Certain financial services firms (CBEST testing) Certain telecommunications network operators (TBEST testing)	Enables assessment of firm-specific resilience to particular operational threats. Can thereby highlight vulnerabilities and enable firms to take relevant resilience-promoting measures.	Low (though potentially burdensome for smaller firms).
Regulation of capital structure/prudential standards (e.g. regulatory capital requirements)	P	Banking, insurance	Prevents firms from operating with excessive financial risk, thereby reducing the risk of insolvency and consequent supply disruption.	Medium
Market oversight regimes	P	Adult social care	Enables early identification of emerging resilience issues (for example, risk of insolvency or strategic exit of key suppliers), and assessment of capacity of remaining suppliers to absorb customers in the event of firm exit.	Medium/low – potential to create compliance burdens that disadvantage smaller firms.

¹⁰⁹ Reverse stress testing involves firms considering what events would be likely to make it no longer viable.

Regulatory requirements and supervision of operational resilience	P	Financial services ¹¹⁰	Enables a consistent approach across firms in a market to monitoring and mitigating risks to operational resilience, and recovering from disruptions.	Medium/low – potential to create compliance burdens that disadvantage smaller firms.
Mandatory stocking obligations	R	Oil ¹¹¹	Helps alleviate short-term supply shocks and/or demand volatility for essential goods . May be especially useful where barriers to entry/expansion delay new supply coming online, or where there is a dependence on imports from an unreliable or concentrated range of sources.	Medium (if obligations apply to business): if storage requires significant capital investment, such requirements can increase barriers to entry and disadvantage smaller firms. Can be mitigated through measures that allow obligations to be transferred, e.g. tradeable permits.
Ringfencing ¹¹²	P	Banking	Potentially helps to deal with cases where businesses supply both essential and non-essential goods/services, preventing financial risk taken in the non-essential part of the business from affecting supply of the essential part.	Medium – requires firms to undertake significant and costly changes to organisation and governance. Potential for firms to be deterred from entering/expanding if doing so leads to them being caught by the regime.

¹¹⁰ FCA: “We’ve introduced new rules and guidance to strengthen operational resilience. We’ll assess the impact of this by testing firms’ operational resilience, business continuity and incident response plans, cyber security and third-party management. We will look at how resilient firms are to disruptions as well as the severity and scale of actual disruptions”

¹¹¹ The IEA requires member countries to maintain emergency oil reserves equivalent to at least 90 days of net oil imports. Some countries maintain state-owned oil stocks. The UK meets its obligations by directing companies to hold stocks (Energy Act 1976, s6).

¹¹² Mandated separation (in the banking case, financially, operationally and organisationally) of certain production from the rest of the business (in the banking case: retail banking from investment banking and international activities)

Temporary relaxation of regulatory requirements	R	Ventilators, PPE and testing kits during Covid-19 ¹¹³	Can help to address regulatory barriers to entry and expansion , thereby minimising the duration of disruption arising from supply shortages.	Low/medium – may distort competition if certain firms are subject to different requirements for a prolonged period.
Demand restraint	P / R	R: oil ¹¹⁴ , water	<p>In a remedial context, can help to mitigate disruption caused by surges in demand, or (equivalently) shortages caused by failure or disruption to a major supplier.</p> <p>In a preventative context, combined with promotion of alternatives (see above), can encourage customers to seek alternatives, thereby making a good/service less essential.</p>	Low, provided restrictions do not favour access by certain businesses within a market over others.

¹¹³ <https://www.gov.uk/guidance/exemptions-from-devices-regulations-during-the-coronavirus-covid-19-outbreak>

¹¹⁴ Under the Energy Act 1976, the government has the authority to regulate or prohibit the production, supply, acquisition, or use of oil or petroleum products. The demand restraint measures available in the United Kingdom are set out in the National Emergency Plan for Fuel (NEP-F). They range from light-handed measures to the allocation and rationing of oil products. In a disruption that requires central government action, light-handed measures are preferred.

Procurement policy				
Mandatory resilience provisions in public sector contracts (e.g. business continuity, disaster recovery, financial distress remediation, insolvency continuity provisions, etc.)	P / R	Range of government contracts. ¹¹⁵	Depending on scope of contractual provisions, can mitigate disruption in the supply of essential goods/services to government arising from a range of sources, including disasters, financial distress and insolvency. In principle, can prevent suppliers operating with excessive financial risk from winning contracts.	Medium – restrictive requirements on bidders for public sector contracts and/or burdensome contractual provisions can reduce supply diversity.
Procurement flexibility (e.g. dynamic purchasing systems)	P / R	Lateral flow tests; forensic services	Can help to stimulate diversity of supply, reduce barriers to entry and expansion , and increase overall capacity – for example, by replacing individual, large long-term contracts with smaller and more frequent/ongoing opportunities for suppliers.	Low, provided arrangements do not create undue barriers to supplier participation. Flexibilities may only be appropriate/effective in certain contexts. ¹¹⁶
Advance purchasing agreements	P	Influenza vaccines	Can support investment in the production of essential goods/services that firms might otherwise be reluctant to supply because of demand uncertainty (i.e. addressing certain types of financial risk).	Low/Medium – the conditions in which APAs are negotiated may lead to government buying more than is necessary and/or paying a price well above the competitive level, leading to a distortion of potential suppliers' incentives.

¹¹⁵ Business continuity and disaster recovery planning requirements are an optional part of the government's standard "mid-tier" contract (intended to be used for non-complex services or high value goods). More detailed continuity and recovery arrangements are specified in the Model Services Contract (intended to be a starting point for negotiation on the supply of complex and/or high value services).

¹¹⁶ For example, the LGA recommends dynamic purchasing arrangements are used where there is "a large volume of [potential] suppliers (with no recognised single or natural marketplace or connection between those suppliers) coupled with a large volume of transactions".

Changes to the competition regime					
Competition exemptions	law	R	CO2, groceries, fuel	At times of supply disruption, appropriate co-operation between firms can help to ensure essential goods and services get to the people and businesses who need them, particularly vulnerable consumers .	Medium/high – unless carefully scoped, monitored and time-limited, exemptions can create the conditions for harmful forms of collusion that enable prices to be sustained above competitive levels.
Relaxation of exemptions from merger control	of/ from	R	Banking (2008)	In principle, can preserve supply continuity by enabling a failing firm to be acquired by a competitor.	High – such relaxation is only necessary where a merger would not otherwise be cleared on competition grounds.
Industrial policy/state support and incentives					
Promotion of alternative goods/services (including incentives/financial support)	of	P		Can render a good/service less essential (i.e. more substitutable), thereby mitigating the harm from supply disruption. Ability to substitute also reduces market power of firms in concentrated industries.	Depends on method of promotion. Selective financial support to firms carries higher competition risks.
Supporting existing domestic production (e.g. via subsidy or government stake)		P / R	P: low carbon and renewable energy R: CO2 supply, banking, energy	Can in principle be used preventatively to reduce dependence on imports/overseas suppliers (which may improve resilience when these imports/suppliers are unreliable). But risk of replacing dependence abroad for dependence on an inefficient and too-important-to-fail domestic firm. Remedially, state support (i.e. bailouts) may be necessary to ensure continuity of supply in the event of	Preventative – medium/high: onshoring can create risks to both competition (through state support of potentially inefficient producers) and resilience (by creating dependence on an inefficient and too-important-to-fail domestic firm). Remedial – high: bailouts can create high risk to competition and resilience both through the provision

			the failure of a supplier of essential goods or services , especially in a concentrated market .	of support to potentially inefficient firms, and through the moral hazard / too important to fail problem.
Promotion of recovery, reuse and recycling	P	Critical minerals	Can improve diversity of supply by providing a (new) domestic source of production from end-of-life products.	Depends on method of promotion. Selective financial support to firms involved in recycling and recovery carries higher competition risks.
Trade policy				
Trade facilitation	P		Can improve diversity of supply by enabling imports (in the first place, or from a wider range of sources).	Low – measures that increase openness to international trade are generally pro-competitive.
Trade defence measures	P	Steel ¹¹⁷	Can help to preserve or stimulate diversity of supply where domestic producers are harmed by unfair trade practices and might otherwise exit the market (resulting in over-dependence on imports).	Low, provided they do not shield inefficient firms from fair competition.
Export bans	P / R	Medicines ¹¹⁸	Can prevent or mitigate shortages of essential goods	Low, although can potentially reduce supply diversity (harming competition and potentially resilience) in the same or other markets if they prompt retaliatory measures by trade partners.

¹¹⁷ See, for example, [Trade remedies notice 2023/03 on Rebar anti-dumping measures](#)

¹¹⁸ The UK government restricts the export and hoarding of some medicines placed on the market in the UK for UK patients. Exporting or hoarding of medicines on this restricted list is considered to be a breach of the Human Medicines Regulations 2012.