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# Competition *policy brief*

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## EU merger control and innovation

### Introduction

Innovation is a critical component for the success of the Commission's top priority of boosting jobs, growth and investment<sup>1</sup>. This Competition policy brief discusses the specific contribution of merger enforcement to the protection and promotion of innovation as one parameter of competition alongside price and output and other factors. It sets out how the EU merger control regime takes into account both negative and positive innovation effects of mergers that fall within its jurisdiction.

Section 1 discusses the benefits of competition for innovation in light of economic theory. Section 2 summarises the EU merger control rules for assessing innovation effects. Section 3 sets out how they have been applied to merger cases.

### 1. Benefits of competition for innovation

Do mergers that increase market power lead to more or less innovation? Economic theory offers two seemingly conflicting responses.

Scholars following in the footsteps of **Joseph Schumpeter's** theory of continuous innovation and creative destruction<sup>2</sup> submit that *less* competition in a market leads to more innovation – at least in dynamic, high tech industries in which competition is more about the development of new products and services than about price or output. Less competition increases the post-innovation rewards for the innovator, which in turn will increase the incentives to engage in research and development (R&D). Even if there is little price competition *in* the market, innovation competition from firms seeking to take over the leading supplier's role (competition *for* the market) will goad the current market leader to invest in innovation to stay ahead, or else lose its market position to rivals.

<sup>1</sup> See [http://ec.europa.eu/priorities/jobs-growth-investment/index\\_en.htm](http://ec.europa.eu/priorities/jobs-growth-investment/index_en.htm).

<sup>2</sup> J.A. Schumpeter, *Capitalism, Socialism and Democracy*, 1942.

### In a nutshell

Innovation is essential to increasing productivity in the EU, and thus contributes to boosting growth and jobs. The EU framework for merger control allows the Commission to assess the impact of mergers and acquisitions on innovation. The framework puts the competitive harm caused by reduction of innovation on an equal footing with increased prices and reduced output.

In recent pharmaceutical and medical devices mergers as well as the *GE/Alstom* case, the Commission found that these horizontal mergers would lessen innovation competition. In its *Deutsche Börse* judgment, the General Court upheld a similar finding. Remedies in horizontal innovation cases typically include the divestment of products that are still in the pipeline.

Harm to the ability to innovate of the merged entity's rivals was probed in a number of non-horizontal ICT mergers, including *Intel/Mc Afee*, *ARM/Giesecke & Devrient/Gemalto Joint Venture*, *Telefonica UK/Vodafone UK/Everything Everywhere Joint Venture* and *Intel/Altera*. Remedies in this type of case may also involve access remedies and/or other non-divestiture remedies.

At the same time, the EU merger control regime acknowledges that mergers may result in synergies arising from innovation that can offset anti-competitive effects. In *TomTom/TeleAtlas*, the Commission recognised innovation efficiencies that were at least partly merger-specific and beneficial to consumers.

Conversely, **Kenneth Arrow** and other scholars in his tradition argue, in a nutshell, that *more* product market competition spurs innovation<sup>3</sup>. Firms under competitive pressure will strive to produce better or more cost-efficient products and services than their competitors, to outperform them. In a competitive environment, a newly invented product will not cannibalise the firm's own profit as much as it would under a less competitive market structure. In a competitive market, an invention will allow the inventor to gain sales from competitors and will therefore be applied to a higher output. Innovation incentives depend not on post-innovation profits *per se* but on the difference between post-innovation and pre-innovation rents. For these reasons, less competition *in* the market would reduce the incentives to innovate.

A wealth of theoretical and empirical literature revolves around Schumpeter's and Arrow's views. There have been attempts to find a unified framework. For one, **Carl Shapiro** argues that the Schumpeterian and Arrowian schools of thought are compatible and converge on three principles<sup>4</sup>. First, both accept that markets need to remain *contestable* for innovation to flourish. Second, increased *appropriability* – the extent to which a firm can capture the value created by its innovation and protect the competitive advantage associated with it – will increase the incentive to innovate. Third, *synergies*, arising for instance from the combination of complementary assets necessary to engage in R&D, will enhance the ability to innovate.

In sum, Arrowians stress the *ex ante* perspective on how to foster innovation, suggesting that a competitive market promotes innovation best. The Schumpeter hypothesis is mainly focused on the *ex post* perspective. The more firms can expect to appropriate the fruits of their innovations (for example, thanks to strong protection of intellectual property rights (IPRs)), the stronger are the incentives to invest in them. As long as competition policy promotes contestability (i.e. by keeping markets competitive) and does not unduly negatively affect appropriability, it will be compatible with both Arrow and Schumpeter and therefore will encourage innovation<sup>5</sup>.

<sup>3</sup> K.J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *The Rate and Direction of Inventive Activity: Economic and Social Factors*, 1962, p. 609-625.

<sup>4</sup> Carl Shapiro: *Competition and Innovation. Did Arrow Hit the Bull's Eye?*, in Josh Lerner and Scott Stern: *The Rate and Direction of Inventive Activity Revisited*, 2012, p. 361-410. In related work, Philippe Aghion and co-authors argue that too little or too much competition in a market would be negative for innovation. They find empirical support for an inverted-U-shaped relationship between the degree of competition and an industry's R&D intensity. However, the implications for policy of their economic setting has been criticised by Shapiro, amongst others, because it is not directly relevant to competition policy (including merger control), due to the way in which it models a higher degree of product market competition. In this work higher competition does not imply higher contestability, but it is instead modelled as a higher degree of product or process imitation (i.e. reduced appropriability) or less product differentiation (see page 370 *et seq.*).

<sup>5</sup> See also Johannes Laitenberger, *Competition and Innovation*, speech at CRA Annual Brussels Conference, 9 December 2015, [http://ec.europa.eu/competition/speeches/text/sp2015\\_04\\_en.pdf](http://ec.europa.eu/competition/speeches/text/sp2015_04_en.pdf).

### Defining innovation

While the EU legal framework for merger control does not define the concept of innovation, economic and business literature identify a number of forms and shades of innovation.

First, a common distinction is between product and process innovation. **Product innovation** is the introduction of goods or services that are new or significantly improved with respect to their characteristics or intended uses. **Process innovation** is the implementation of a new or significantly improved production or delivery method.

A second distinction concerns technological processes<sup>6</sup>. **Incremental innovation** marks a small step forward – e.g. adding slow motion to a videocassette recorder (VCR) – whereas a **Breakthrough innovation** involves a significant technological jump (e.g. replacing VCRs with DVDs).

A third distinction refers to the relationship between an innovation and the value network around it. **Sustaining innovation** takes place within the value network of the established firms and gives customers something more or better in the attributes they already value (e.g. DVDs are the result of sustaining innovation). **Disruptive innovation** takes place outside that value network and introduces a different package of attributes from the one customers historically value. For instance, streaming videos over the Internet introduced the possibility of accessing content anywhere, although streaming performed worse in terms of the historical value of quality – at least initially.

## 2. EU framework for analysing innovation effects in mergers

The EU legal framework for merger control fits well with the economic principles of contestability, appropriability and synergies.

The substantive test for assessing mergers as embedded in the EU's Merger Regulation<sup>7</sup> is based on a significant impediment of effective competition (SIEC). The SIEC test covers all aspects of a loss of competition, including harm to consumers resulting from hampering innovation. A reduction in competitive pressure can harm innovation in the market just as it can affect prices and output.

<sup>6</sup> For more detail on the following, see OECD Global Forum on Competition, *Disruptive innovation and competition policy enforcement*, Note by Alexandre de Stree and Pierre Larouche, 2015, <http://www.oecd.org/competition/globalforum/disruptive-innovations-competition-law-enforcement.htm>. That note draws on the seminal paper by Joseph L. Bower and Clayton M. Christensen "Disruptive Technologies: Catching the Wave", 44. *Harvard Business Review*, 1995.

<sup>7</sup> Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation), Official Journal L 24, 29.01.2004, p. 1-22.

If anti-competitive effects of a merger have been established, the Merger Regulation also recognises that efficiencies – including synergies arising from innovation – can offset the harm, provided that the efficiencies put forward by the merging parties are beneficial for consumers, merger-specific and verifiable.

### Horizontal mergers

The European Commission's Horizontal Merger Guidelines<sup>8</sup> (HMG) state that one of the effects to be analysed in merger control is "the effect on innovation", putting the competitive harm caused by a reduction of innovation on an equal footing with price increases, or a reduction of output, choice or quality of goods and services<sup>9</sup>. According to the Guidelines, the aim of the Commission's merger control is to prevent mergers that would be likely to deprive customers of these benefits, including innovation.

Consequently, loss of innovation can be at the heart of the anti-competitive effects of a merger. The HMG specify that if a merger combines two important innovators, or eliminates a firm with promising pipeline products, the transaction can eliminate an *important competitive force* and thus lead to a significant impediment of effective competition against which the Commission should intervene<sup>10</sup>. The innovation potential of the merging firms is taken into account *regardless of the current market position of the companies*<sup>11</sup>. This allows the Commission to consider firms that are not actually present in a given market but are potential competitors, and firms that are developing products for a new intended use that are likely to compete in new product markets<sup>12</sup>.

For a merger with a potential competitor to raise serious competition concerns, it is in principle necessary to show, firstly, that the potential competitor currently acts as a significant competitive constraint, or there is a significant likelihood that, absent the merger, it would grow into an effective competitive force in the foreseeable future. This is more likely in particular when the market is already concentrated, as in a market with many actual competitors a potential entrant is, in principle, less likely to be a significant competitive constraint<sup>13</sup>. Secondly, it needs to be established that there are not enough actual or potential competitors to maintain the necessary competitive pressure after the merger. In particular, barriers to entry must be

<sup>8</sup> Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings, Official Journal C 31, 5.2.2004, p. 5-18.

<sup>9</sup> Paragraph 8 HMG.

<sup>10</sup> Paragraph 38 HMG.

<sup>11</sup> See paragraphs 38 and 20b HMG.

<sup>12</sup> See also, by analogy, the Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements. Paragraph 119 states that "R&D co-operation concerns the development of new products or technology which either may – if emerging – one day replace existing ones or which are being developed for a new intended use and will therefore not replace existing products but create a completely new demand."

<sup>13</sup> See paragraph 37 HMG.

high enough to exclude the existence of several other potential competitors, but the merging firm potentially entering the market must be well positioned to overcome these barriers, for instance as it is present in an adjacent or vertically related market or already has specific entry plans.

### Non-horizontal mergers

In the context of vertical or conglomerate mergers, the Non-Horizontal Merger Guidelines<sup>14</sup> (NHMG) provide a similar framework for assessing innovation effects to the framework set out in the HMG. The NHMG acknowledge that one of the effects to be analysed in merger control is the effect on innovation<sup>15</sup>. They also state that mergers involving innovative companies that are likely to expand significantly in the near future will be extensively investigated even when the post-merger market share is below 30%<sup>16</sup>. Non-horizontal mergers may involve foreclosure scenarios that hinder innovation by other market players, for instance when a competitor would likely lose access to the merged entity's product that is needed for it to innovate and remain in the market.

### Efficiencies

When assessing a transaction the Commission considers also the positive effects of the mergers, in terms of both cost savings and quality improvements of the products that increase the competitiveness of the companies (efficiencies), provided that such positive effects also benefit consumers. Such efficiencies may counteract adverse effects on competition which a merger might otherwise have<sup>17</sup>.

The Merger Regulation acknowledges in Recital 29 that the assessment of such efficiencies claims constitutes an integral part of merger case analysis. This principle is further spelled out in both the HMG and the NHMG.

<sup>14</sup> Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings, Official Journal C 265, 18.10.2008, p. 6-25.

<sup>15</sup> See paragraph 10 NHMG.

<sup>16</sup> See paragraph 26 NHMG.

<sup>17</sup> No merger case has so far been approved by the European Commission exclusively on the basis that the merger-specific efficiencies would offset consumer harm. In some cases, however, efficiency claims made by merging parties were partially accepted by the Commission and balanced against the competition harm. This was notably the case in Cases No COMP/M.4267 *Deutsche Börse/Euronext*, COMP/M.6570 *UPS/TNT Express*, COMP/M.6905 *Ineos/Solvay*, COMP/M.7421 *Orange/Jazztel* and COMP/M.7278 *GE/Alstom*. Moreover, also in Case No COMP/M.7630 *FedEx/TNT Express*, even though the transaction was ultimately not considered to lead to a significant impediment to effective competition, the Commission found that the transaction would give rise to verifiable, merger-specific efficiencies due to network cost savings which would benefit customers.

The HMG specifically acknowledge that a merger may bring positive innovation effects. These can generally be assessed in the context of efficiencies put forward by the merging parties.<sup>18</sup> The HMG point out that consumers may benefit from new or improved products or services, resulting for instance from efficiency gains in the sphere of R&D and innovation<sup>19</sup>. As for other types of efficiencies, the parties have to demonstrate that innovation-related efficiencies (i) will be passed on to consumers, (ii) are verifiable and (iii) merger-specific; that is, that they can only be attained through the merger (and not, for example, through a cooperation agreement). Such efficiencies may outweigh a merger's anti-competitive effects.

The NHMG also tackle positive innovation effects and provide that non-horizontal mergers are usually more likely to create efficiencies than horizontal mergers between rivals. They state that "vertical and conglomerate mergers provide substantial scope for efficiencies" and may be pro-competitive<sup>20</sup>. Increased innovation is recognised as one type of efficiency to be achieved.

### 3. Recent cases assessing effects on innovation

The Commission recently analysed a number of mergers that could have had a negative impact on innovation, although ultimately it did not find anti-competitive effects in all of them. This section discusses, first, recent horizontal mergers that would have resulted in a loss of innovation as the innovation owned by one of the merging firms would likely have been lost. A second type of case concerns vertical or conglomerate mergers where the Commission assessed whether the merged entity could potentially harm innovation by hampering the ability of other market players to innovate. Finally, this section includes mergers in which the parties claimed positive innovation efficiencies.

#### *Horizontal mergers that potentially result in loss of innovation*

As stated above, a horizontal merger can lead to a loss of innovation by eliminating pipeline products that would likely have entered existing markets or that would have created entirely new product markets. In three recent cases in the pharmaceutical and medical devices sectors, the Commission assessed the mergers' impact on innovation in competition and remedied the mergers' negative effects on pipeline products. The stakes are high in these industries, because innovation can literally be a question of life and death.

The **Medtronic/Covidien** merger<sup>21</sup> – conditionally approved in November 2014 – brought together two medical device companies. Medtronic is the market leader on the market for drug-coated balloons to treat vascular diseases. There are few competitors currently active in this market and they exert limited competitive pressure on Medtronic. The target company Covidien had a promising late-stage pipeline product, a drug-coated balloon called *Stellarex*. The Commission found that Covidien would have constrained Medtronic in the near future, in view of the promising clinical trial results of *Stellarex*. The transaction would therefore have eliminated a credible competitor and would likely have reduced innovation in this area. In order to address these concerns, Medtronic committed to selling Covidien's worldwide *Stellarex* business, including in particular manufacturing equipment, related IPRs and scientific and regulatory material necessary to complete the *Stellarex* trials, and key personnel. The remedies provided the purchaser with all the assets required to bring *Stellarex* to the market. In January 2015, Spectranetics Corporation announced that it had completed the acquisition of Covidien's *Stellarex*.

The acquisition by pharmaceutical company **Novartis** of **GlaxoSmithKline's (GSK) oncology business**<sup>22</sup> was different in that the Commission's concerns related to both late-stage (phase III) and earlier stage (phases I and II) pipelines in connection with the same drugs. The Commission identified the risk that Novartis would likely have stopped developing two innovative drugs that showed great promise for the treatment of skin and ovarian cancer (for which late-stage clinical trials were being conducted) and that were also tested for treating several other cancer types (for which early-stage clinical trials were ongoing). This is because Novartis would acquire drugs with the same mechanism of action from GSK, which would have resulted in duplicate clinical programs (that are lengthy and costly).

In its decision of January 2015, the Commission found that the transaction would have led to a duopoly between the merged entity and Roche for these specific skin and ovarian cancer treatments. Furthermore, the Commission took into account the expected role of these drugs in the treatment of a number of other cancers such as colorectal and lung cancer. The Commission found that the merger would likely have reduced innovation in the area, as Novartis would likely have abandoned its early-stage clinical trial programme of the two drugs.

The Commission approved the transaction on condition that Novartis would fully return one of the drugs to its owner and licensor Array BioPharma Inc. (Array) and divest the other drug to Array.

<sup>18</sup> On efficiencies, see recital 29 of the EU Merger Regulation, as well as section VII of the HMG.

<sup>19</sup> See paragraph 81 HMG.

<sup>20</sup> Paragraph 13 NHMG. See also paragraphs 52-57, 77 and 115-118.

<sup>21</sup> Case No COMP/ M.7326, *Medtronic/Covidien*, Commission decision of 28 November 2014.

<sup>22</sup> Case No COMP/M.7275, *Novartis/GlaxoSmithKline's oncology business*, Commission decision of 28 January 2015. See also *Protecting the drugs of tomorrow: competition and innovation in healthcare*, Competition merger brief, Issue 2/2015, p.1-4.

To address the early-stage pipeline concerns, the remedy ensured, through a cooperation agreement between Array and a suitable partner, the worldwide development of existing and new clinical studies. If successful, they may lead to the commercialisation of new treatments in the mid- and long-term. In November 2015, Array announced its cooperation with Pierre Fabre S.A. for the worldwide development and commercialisation of the two treatments.

In the **Pfizer/Hospira** case<sup>23</sup> conditionally approved in August 2015, one of the Commission's concerns related to a specific biosimilar drug for treating autoimmune diseases (such as rheumatoid arthritis). Biosimilar drugs aim to have the same therapeutic mechanism as, and be clinically equivalent to, original patented biological pharmaceuticals (in this case a drug called *infliximab*, marketed in the EEA by Merck as *Remicade*). However, unlike generics, biosimilars are not exact copies. Consequently, there is room for differentiation strategies and non-price competition between distinct biosimilars of the same molecule. Biological drugs are among the most expensive therapies, and biosimilars are expected to lower prices for healthcare systems and widen patients' access to biological drugs.

At the time of the investigation, only one *infliximab* biosimilar was on the market. It had been developed by Celltrion of South Korea and was co-marketed independently and under competing brands by Hospira and Celltrion. Pfizer was at an advanced stage of development of a competing biosimilar, as was Samsung Bioepis. The Commission found that, following the merger, one of two scenarios would likely have materialised: (1) Pfizer would have delayed or discontinued development of the biosimilar drug to focus on Hospira's product. This would have led to the net loss of future competition by one of only three differentiated biosimilars in advanced development stages. (2) Alternatively, Pfizer would have handed back Hospira's product to Celltrion, leading to the loss of current price competition between the two companies. The remedy accepted by the Commission preserved future innovation in biosimilars by providing for the full divestment of Pfizer's *infliximab* biosimilar drug currently under development (including global development and manufacturing rights as well as appropriate IPRs, technology and know-how, with a licence of non-EEA marketing rights back to Pfizer). In February 2016, Novartis announced that it had acquired the divestment business.

While innovation rivalry is a particularly important competitive factor in the pharmaceutical and medical devices sectors and R&D is structured in such a way that it is possible at an early stage to identify competing products<sup>24</sup>, the Commission's recent merger case practice also includes innovation cases in other industries such as engineering.

<sup>23</sup> Case No COMP/ M.7559, *Pfizer/Hospira*, Commission decision of 4 August 2015.

<sup>24</sup> This is explicitly acknowledged in paragraph 120 of the Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements.

The **General Electric/Alstom** merger<sup>25</sup> conditionally cleared in September 2015 concerns gas turbines used to generate electricity, where incremental innovation is undertaken by established suppliers. The Commission found that disruptive innovation from new entrants and start-ups would be unlikely. This is because barriers to entry are very high in this sector and customers attach great importance to product reliability and to a supplier's long-term track record.

The operation, as notified to the Commission, would have eliminated one of the four full-technology companies that are able to produce large and very large gas turbines worldwide. The Commission's investigation showed, among other things, that Alstom is an important competitive force from an innovation and technology point of view, often best in class in terms of technology, allowing for operational flexibility, a crucial aspect for European customers<sup>26</sup>. Alstom's removal would reduce the competitive pressure on the other competitors to invest significantly in innovation. Moreover, the Commission established that General Electric would likely have discontinued some of Alstom's products – including an existing turbine called GT26 and a pipeline product called GT36 – and closed the innovation pools developed by Alstom. This would have resulted in innovation harm in two respects. First, customers would have been deprived of new and innovative machines. Second, discontinuation would have affected future technology upgrades of GT26 turbines that were already installed. If regularly upgraded, these turbines have a very long life cycle. In addition to more traditional unilateral effects resulting from the loss of competition between the merging parties, the decision also established that the discontinuation – resulting in a loss of product variety – would further reduce the competitive pressure on the market's number two, Siemens. The analysis of bidding behaviour shows that the product discontinuation would further negatively affect prices in many tenders for large and very large gas turbines.

The Commission cleared the transaction subject to a comprehensive remedies package that ensures that competition, and in particular, innovation, will continue in this sector. The package comprises the divestment of the technology for the GT26 and GT36 turbines, of existing upgrades and of pipeline technology for future upgrades of turbines. To strengthen the purchaser's ability and incentive to further improve the divested technology, a significant share of Alstom's long-term servicing agreements for GT26 turbines is also part of the package. Finally, it includes the divestment of two test facilities for the above turbines as well as a large number of Alstom R&D engineers.

<sup>25</sup> Case No COMP/ M.7278, *General Electric/Alstom* (Thermal Power-Renewable Power & Grid Business), Commission decision of 8 September 2015.

<sup>26</sup> This is because the sizeable share of renewables in the EU's energy markets leads to temporary peaks in energy creation, during which gas turbines need to operate at part-load efficiency or be turned down. Alstom's technology is distinctive, based on unique sequential combustion. The GT24/GT26/GT36 sequential combustion gas turbine family allows the highest operational flexibility, providing superior part-load efficiency and turndown capability.

In sum, the remedy enables the purchaser, Ansaldo Energia, to become a full-technology provider, thereby ensuring that innovation will continue in this sector.

In its 2015 judgment in **Deutsche Börse AG v European Commission**, the General Court reviewed a merger case which was prohibited in part because the Commission concluded that it would lessen the merged entity's incentive to innovate and therefore reduce the innovation available to customers<sup>27</sup>. According to the Commission, the combination of Deutsche Börse and NYSE Euronext would have led to a near monopoly on European financial derivatives traded on exchanges. This would have resulted in higher prices and lower incentives to innovate. Specifically, the Commission found that the competition between the parties in technology, process and market design would be lost, since that competition was based on the parties' need to forestall unique competitive threats to their respective franchises from the other party. As a result of the merger, this intensive and unique competition would have been lost. Deutsche Börse appealed, claiming that the Commission's conclusion that the merging parties constrained each other through innovation competition was manifestly incorrect. The Court rejected the applicant's arguments and was satisfied with the Commission's analysis. The Court stressed that the applicant failed to show that the evidence on which the Commission relied was incorrect<sup>28</sup>.

### **Non-horizontal mergers that potentially hamper the ability of third parties to innovate**

In the ICT sector, the European Commission analysed a number of vertical or conglomerate transactions as to whether they would harm the ability of the merged entity's rivals to innovate. Both the **Intel/McAfee** case<sup>29</sup> and the **ARM/Giesecke & Devrient/ Gemalto Joint Venture** case<sup>30</sup> raised vertical input foreclosure concerns. Intel and ARM could use their strong upstream position in processor hardware (design) for computers and smart mobile devices, respectively, to foreclose downstream competitors in certain security software solutions. Both transactions were approved with commitments after a first-phase investigation.

In **Intel/McAfee**, a key competition concern was that, after the merger, Intel would have the ability and incentive to hamper endpoint<sup>31</sup> security solutions that competed with McAfee's from running on Intel's dominant central processing units (CPUs) and chipsets. Such foreclosure would likely have resulted in negative

effects for rivals to innovate in this market and a significant weakening and possible exit of McAfee's main competitors within two to five years<sup>32</sup>. Consequently, the accepted remedy ensured that Intel could not block other security software providers from operating on its chips and from bringing innovative competing solutions to the market. McAfee's competitors are guaranteed access to all necessary Intel technical information. Intel committed not to actively impede competitors' security solutions from running on its chips. This was combined with an effective monitoring system and a fast-track arbitration mechanism in case of disputes. At the same time, the commitments preserve the potential innovation benefits of the merger by allowing for the tighter integration of chips with security software.

In the **ARM** case, the Commission found that ARM holds a very strong position upstream as supplier of IP architecture for application processors used in consumer electronics devices and especially in smartphones and tablets. The newly created joint venture (JV) intended to develop and market hardware-based security solutions for such devices to enhance the security of apps like corporate email, premium content delivery and mobile banking. The ARM processor architecture includes a secure hardware extension on which both the JV's and its competitors' forthcoming security solutions would rely. ARM could degrade the interoperability of this hardware extension with software solutions that competed with the JV or withhold or delay the communication of technical information to competitors. As in **Intel/McAfee**, the remedy in this case ensured that rival application processor-based security solutions can be developed and operated on ARM-designed processors, thereby keeping this nascent market open to innovation and competition.

While ARM concerned mobile security solutions more generally, the **Telefonica UK/Vodafone UK/Everything Everywhere Joint Venture** case<sup>33</sup> concerned a specific secure mobile payment system for the UK. The Commission investigated in-depth whether a JV created by three out of four UK mobile network operators to develop a mobile wallet platform would harm innovation in mobile payment systems by other players. The concern was that the JV's three parent companies – via their strong collective position in the market for retail mobile telephony services – would have the technical and/ or commercial ability and incentive to block potential entrants in the wholesale mobile wallet platform market. Notably, they could foreclose access to the handset SIM-cards. Access to SIM-cards might be important for new entrants intending to offer their own mobile wallet services because they can safely store sensitive information needed for mobile payments.

Ultimately, the case was cleared unconditionally in phase II without issuing a Statement of Objections. The Commission concluded that the mobile network operators were unlikely to

<sup>27</sup> COMP/ M.6166 – *Deutsche Börse/NYSE Euronext*, Commission decision of 1 February 2012, section 11.2.1.3.4.

<sup>28</sup> *Deutsche Börse AG v European Commission*, T-175/12 [2015]: paragraphs 157-179.

<sup>29</sup> Case COMP/ M.5984 – *Intel/McAfee*, Commission decision of 26 January 2011.

<sup>30</sup> Case COMP/ M.6564 – *ARM/GIESECKE & DEVRIENT/GEMALTO JV*, Commission decision of 6 November 2012.

<sup>31</sup> Endpoint refers to a broad array of devices, notably desktop, notebook and handheld devices.

<sup>32</sup> Competition Policy Newsletter, *Intel/McAfee*, N.2/ 2011, p.10.

<sup>33</sup> Case No COMP/ M.6314 – *Telefónica UK/Vodafone UK/Everything Everywhere JV*, Commission decision of 4 September 2012.

have the ability and/or the incentive to foreclose potential rivals. First, a number of alternative offerings already existed (in markets other than the UK) which do not store sensitive data on SIM-cards but on a secure element embedded in the handset itself. Second, the Commission found it was unlikely that the JV's parents could block access to embedded secure elements using technical or commercial means.

Finally, in the *Intel/Altera* case<sup>34</sup>, the Commission investigated a conglomerate relationship between Intel's CPUs for servers and Altera's FPGA<sup>35</sup> chips that customers can programme to speed up the processing of specific server tasks such as running algorithms for recognising images or for search (so-called "workload acceleration"). In particular, the Commission assessed whether Intel could foreclose Altera's competitors by not giving them access to its proprietary technologies (called QPI and KTI) that connect the CPU to the FPGA. The Commission ultimately concluded that the open standard interconnect technology called PCIe was a viable alternative to QPI/KTI for Altera's FPGA competitors. Moreover, it took into account that Intel had granted licences to QPI and KTI to some FPGA competitors and had recently made an unconditional and binding offer to enter into such licence agreements to others.

### Innovation efficiencies

Merging parties rarely use innovation in efficiency defences<sup>36</sup>. One exception was the *TomTom/TeleAtlas*<sup>37</sup> deal, unconditionally cleared in 2008, where such efficiencies were partly recognised. The vertical merger combined a leading producer of navigation systems with a digital maps developer. The Commission recognised, first, that the removal of certain double mark-ups met the legal test for efficiencies. Second, the parties claimed that the merger would lead to substantial innovation efficiencies: information obtained from TomTom's users could be used to improve the quality and timing of Tele Atlas's maps-creation.

The Commission acknowledged that these innovation-related efficiencies were at least partly merger-specific and would bring consumer benefits. However, it found that the two studies

submitted by the parties to quantify these efficiencies were not particularly convincing<sup>38</sup>. At any rate, in that case it was not necessary to estimate precisely the magnitude of likely efficiencies, given the proposed transaction's lack of anti-competitive effect irrespective of efficiencies.

### Conclusion

The EU's legal framework for merger control explicitly addresses a merger's effects on innovation – either positive or negative – in line with the economic principles of contestability, appropriability and synergies. The discussion of a number of recent horizontal and non-horizontal merger cases illustrates how the legal framework has been applied in practice. It shows that innovation can be an important competitive factor, which EU merger control is well equipped to safeguard. First, theories of harm involving loss of, or harm to, innovation have been at the core of a number of merger cases where the Commission intervened. Second, remedies can be, and have been, designed with the specific goal of preserving innovation. While remedies are tailored to each case, divestments of pipeline products are frequently part of remedies in horizontal cases. Non-horizontal mergers that likely hamper innovation by other market players may in certain instances, depending on the specifics of each case, also be solved by means of access remedies and/or other non-divestiture remedies. Finally, the EU legal framework also acknowledges that a merger can bring positive innovation effects, which are assessed in the context of efficiencies. Such innovation efficiencies need to be verifiable, merger-specific and likely to be passed on to consumers.

<sup>34</sup> Case No COMP/M.7688 – *Intel/Altera*, Commission decision of 14 October 2015.

<sup>35</sup> FPGA stands for Field-Programmable Gate Array.

<sup>36</sup> More recently, there have been efficiency claims relating to investments in mobile telecommunication networks, which raise similar issues to innovation-related efficiency claims. For instance, in the mobile telecommunication mergers in Ireland and Germany the Commission analysed whether the mergers would bring material additional benefits in terms of network coverage, speed and quality. In both cases, it concluded that any improvements would be limited and could not outweigh the consumer harm and/or would be not merger-specific. See Case No. COMP/ M.6992, *Hutchison 3G UK/Telefónica Ireland*, Commission decision of 28 May 2014, section 7.10., and Case No. COMP M.7018 *Telefónica Deutschland/E-Plus*, Commission decision of 2 July 2014, sections 6.9, and 6.10.

<sup>37</sup> Case No COMP/M.4854, *TomTom/TeleAtlas*, Commission decision of 14 May 2008.

<sup>38</sup> *Ibid.*, paragraphs 244-250. Similarly, in case COMP/M.6203 *Western Digital Ireland/Vivity Technologies*, the Parties had claimed innovation efficiencies (in terms of greater and faster product development) arising from combining the merging firms' R&D resources. However, the Commission found these claims not verifiable because no detailed quantitative or other evidence was submitted that would allow their credibility to be verified (Commission decision of 23 November 2011, paragraphs 996-1007).