Qualcomm Incorporated's Comments on “Shaping competition policy in the era of digitization”

1. Introduction

Qualcomm Incorporated (“Qualcomm”) respectfully submits this paper in response to the European Commission's (“Commission”) call for contributions on topics related to “Shaping competition policy in the era of digitization”. Qualcomm commends the Commission for engaging in this reflection and seeking stakeholder input on the upcoming challenges facing the digital economy and their implications for competition policy.

Qualcomm has been a leading developer of wireless communications technology, making it possible to apply code division multiple access (“CDMA”) technology to commercial cellular wireless networks, enabling high speed data extensions of 3G networks, and developing 4G systems and standards based on orthogonal frequency division multiple access (“OFDMA”). Today, Qualcomm is leading the way in the design and development of 5G technologies and standards that enable a variety of new technologies and ecosystems across a number of industries.

To become such a leading developer of cutting-edge wireless communications technologies, Qualcomm has not only invested significant resources in research and development (“R&D”) and technology development, but also partnered closely with the companies that form the device ecosystem enabling access to 3G, 4G, and 5G technology. For these reasons, Qualcomm is uniquely positioned to offer views on the implications of digitization for competition law and policy.

In the present submission, Qualcomm offers some observations on the Commission's guidance paper on exclusionary abuse (“Guidance Paper”). Specifically, we identify a series of concerns in connection with the use of market share analysis as a method to assess the degree of market power in rapidly-evolving high-technology industries and markets.

2. High-Technology Markets

“High-technology markets” is a term often used to describe markets which are characterized by a rapid pace of innovation and technological progress. Other labels to describe these markets include technology-enabled

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1 Call for contributions: Shaping competition policy in the era of digitisation, http://ec.europa.eu/competition/scp19/
markets, dynamically competitive industries, innovative industries, new economy markets, the innovation economy, and the digital economy. In the modern economy, these markets are crucial for value creation, growth and employment at regional, national, and global levels. The industries that comprise such high-technology markets require continuous and intense innovation, typically driven by large R&D investments. The output – technology, products or services -- is often technically complex with a short life cycle. Examples of such output include microprocessors, chipsets, computer software, online distribution, B2B eCommerce, etc.

As every other industry, high-technology industries are subject to market forces. However, certain forces are particularly important in these industries and should be explicitly considered when measuring market power. These forces are:

i. Dynamic competition - the intense degree of innovative efforts and rapid pace of innovation. In high-technology markets, competition takes place for the market and not merely in the market. Because competition for the market revolves around drastic innovation, these markets are characterized as dynamic. Dynamic competition (in contrast to static competition) is uniquely characterized by even more intense innovative efforts and faster innovation cycles. Firms in high-technology markets should invest a great deal to develop their products, either because they must make significant and risky investments in R&D, or because they must invest in a physical or virtual network to create and deliver the output. Labor compensation accounts for a relatively high fraction of the costs in these markets, as they tend to have more highly educated workforces than non-high-technology industries; accordingly, they tend to use more human capital. As has been widely recognized, dynamic competition

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11 Id.
improves productivity, the availability of new goods and services, and, more generally, consumer welfare.\textsuperscript{12}

\begin{enumerate}
\item \textbf{First-mover advantage and winner-takes-all effects.} Drastic innovation creates a new market and confers (temporary) market leadership on the firm that brought about such innovation. Winners of such competition for the market typically obtain large market shares and possibly high profits – at least at the outset.\textsuperscript{13} Provided that the first-mover will service the entire (or most of the) market demand, for some period of time, it may benefit from economies of scale that later entrants may not be able to replicate in the short term.\textsuperscript{14} First-mover advantage and winner-takes-all effects are particularly acute in high-technology markets, as they are characterized by intense demand for breakthrough innovation. In the past, various firms have enjoyed high market shares as a result of their first-mover status: Cisco – 80% (Internet routers), eBay – 80% (online auctions), Microsoft – 94% (PC operating systems), Intel – 82% (PC microprocessors).\textsuperscript{15}

\item \textbf{Importance of standard development activities.} In many high-technology industries, a diverse set of firms voluntarily coordinate their efforts to define and develop the technical solutions that will enable new products or services through the creation of technology standards. Such standards ensure that new technologies, products and services with multiple inter-working components are interoperable thus enabling a larger market.\textsuperscript{16} Technology standards lower barriers to entry, lock-in effects, and challenge established business models and powerful incumbents in remote markets, spurring competition and innovation.\textsuperscript{17}
\end{enumerate}

3. \textbf{The Fallacies of Market Shares as an Indicator of Market Power in High-Technology Markets}

Under current antitrust enforcement standards, significant and perhaps excessive weight is assigned to the analysis of market shares for the purposes of establishing the existence of a dominance position. This is so

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\textsuperscript{12} See, e.g., Gregory J. Sidak, and David J. Teece, \textit{supra} note 9.
\textsuperscript{13} See David S. Evans and Richard Schmalensee, \textit{supra} note 10.
\textsuperscript{14} See Miguel Rato and Nicolas Petit, \textit{supra} note 3.
\textsuperscript{15} See David S. Evans and Richard Schmalensee, \textit{supra} note 10.
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The inherent weaknesses of market shares as a tool to measure market power in such industries is due to several factors, discussed in more detail below.

First, in high-technology markets, the first-mover in a new technology may initially capture a large share of the market. However, in such circumstances a high market share is not a symptom of market failure liable to harm consumers; rather, it is a sign of a well-functioning market characterized by healthy dynamic competition. First-movers are able to reduce costs by being the first to shift the learning curve downwards. Additionally, first-movers may also benefit from economies of scale in R&D in the short term: because first-movers tend to be larger than subsequent entrants at the time those rivals enter the market, first movers can spread the investments sunk in R&D over a larger number of items than the later entrants. And it is precisely the availability of such rewards – i.e. sizable market shares, lower costs, and potentially higher profit margins – that provide the incentives necessary to undertake the highly risky and costly investment in R&D activities required to compete.

Second, any high market share obtained by the first mover is often ephemeral and will gradually decline within a very short time period. Competitive models based on neo-classical microeconomics have shown that rivalry leads to the erosion of economic rents temporarily monopolized by first movers. Industries with high returns attract new entrants until the price of each firm falls to a normal profit level. In high-technology industries, the incumbents are, with very rare exceptions, under the permanent threat of entry, as high returns attract rivals. Competitors will invest heavily to displace the leader sooner or later and seriously contest market leadership. As a result of the fierce price competition that ensues, typically enabled by the low marginal costs that characterize many high-technology markets, market leaders are not able to retain their market power and

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19 Id.
industry profits are squeezed until the whole industry falls to a zero-profit level. Moreover, competitors can profit from the resolution of technological uncertainty (i.e., whether an innovation activity will actually lead to an invention or innovation) and market uncertainty (i.e., market potential of an innovation).

Third, a dominant position in a high-technology market can be also eliminated when a rival firm brings to market a successful innovation that allows it to take over the whole market. In particular, a new firm will often come up with a new innovation that causes demand for the incumbent's product or service to collapse entirely. The new output might be not just a (vastly) better version of the old one, but an entirely different product or service that makes the incumbent's technology obsolete, and therefore eliminates the demand served by the incumbent. Hence, new technologies will not only enhance a firm's competency, they may also destroy it. The unique feature of dynamic competition is exactly this, namely, that technological change itself shapes industry structure.

The economic literature contains some empirical studies about the first-mover advantage in the Information and Communication Technology ("ICT") sector that indicate that such an advantage is temporary. For instance, a study of the long-distance telecommunications and personal computer industries finds that both timing and order of market entry are important and that reactions of rivals undermine the durability and stability of first mover advantages. The authors find that first-movers achieve greater gains than followers, and that first movers suffer at the time of new product imitations. Another study concerning the metal oxide semiconductor industry finds that the first manufacturers to introduce new products initially captured a large share of the market but were unable not retain it for long periods.

The Commission has recognized that high market shares in high-technology industries may be fragile. In the decision approving the HP/Compaq merger, the Commission noted that the market investigation had indicated that high market shares were “not a proxy for market power in this technologically rapidly evolving server market” as market shares were volatile and there was strong and dynamic competition. Similarly, in Cisco Systems the Commission held that the consumer communications sector “is a recent and fast-growing sector

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29 Case IV/M.2609 – HP/Compaq
which is characterised by short innovation cycles in which large market shares may turn out to be ephemeral. In such a dynamic context, high market shares are not necessarily indicative of market power. The Commission also noted in the decision approving the Arm/Giesecke & Devrient/Gemalto joint venture that emerging and fast-growing markets are not subject to entry barriers, making new entry very likely. More specifically, the Commission found that the market for Trusted Execution Environments—a area within the main processor of a device that is separate from the main operating system to protect the confidentiality of certain data—was “poised to grow significantly in the coming years, particularly due to the increased uptake of CE devices, including smartphones and tablets. As a result, absent high barriers to entry, such growing market is likely to attract entry from different players...”. U.S. agencies and courts have taken similar positions: for instance, in its seminal ruling in United States v Microsoft, the U.S. Court of Appeals for the District of Columbia Circuit highlighted the role of creative destruction in eliminating market dominance by noting that rapid technological change “leads to markets in which firms compete through innovation for temporary market dominance, from which they may be displaced by the next wave of product advancements.”

Snapshots of market shares reveal little if markets are in turmoil, as they frequently are in high-technology contexts. A firm’s market power today may say little about the firm’s prospects one, two, or five years in the future. Market share may be altogether irrelevant in some cases because markets may exist in which innovation is so characteristic and sustained that firms compete not just for market share, but also for markets as a whole. In fact, competition for the market is likely to be as significant as competition within it. The use of market shares for the analysis of market power in high-technology markets may thus lead to the false conclusion that an undertaking is dominant, while in reality it may be subject to strong competitive constraints. In such markets, the almost certain entry of competitors and/or the high likelihood of radical technological innovation capable of displacing the market leader suggest that market shares alone are an inappropriate metric to assess market power.

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30 Case T-79/12 Cisco Systems and Messagenet v Commission EU:T:2013:635
31 Case COMP/M.6564 – Arm/Giesecke & Devrient/Gemalto/JV.
33 See Gregory J. Sidak, and David J. Teece, supra note 9.
4. A Framework for the Analysis of Competition in High-Technology Markets

Under the traditional framework for the analysis of market power, one begins by defining a relevant market, then identifies competitors within it, and finally allocates market shares. In high-technology industries, however, market concentration is likely to be the outcome of market selecting a winning technology, which is a sign of healthy dynamic competition. Thus, concentration may often have little to do with market power.35 An approach that relies on current market shares as a proxy for the intensity of competition is likely to be highly inadequate because it limits itself to the assessment of actual competition but necessarily ignores potential competitors.36

An essential element of market power analysis (and antitrust analysis as a whole) should be the examination of actual and potential innovative threats to leading firms. The analysis of market power must consider the vulnerability of leading firms to entry fueled by drastic innovation, not just to the entry of firms producing similar products or services. Such an analysis will involve consideration of competitive threats based on technologies and design approaches that differ radically from those used by the incumbent.37 The intensity of potential competition posed by/arising from distinct technologies disciplines the suppliers of existing technologies through the threat of replacement over time. This is because potential competitors are often able to enter existing markets and threaten incumbent technologies in a very short period of time.38 Strategic management research has viewed competition as continuous striving to develop superior capabilities to serve consumers in cost-effective ways.39 In a dynamically competitive market, some of the most important capabilities are the abilities to innovate, to meet customer needs, and to drastically improve products and services.

A proper market power analysis requires an assessment of firms’ capabilities.40 It implies an assessment of the skills and assets required to innovate and the determination of which firms possess such capabilities. Such an analysis will inevitably prove more complex than the simple, mechanical assessment of market shares. It may also prove more challenging, given that it potentially requires that judgments be made about the likelihood of the occurrence of disruptive innovation in the future. But these potential difficulties are not insurmountable: a

36 See J. Gregory J. Sidak, and David J. Teece, supra note 9.
38 See Miguel Rato and Nicolas Petit, supra note 3.
40 See J. Gregory J. Sidak, and David J. Teece, supra note 9.
vast literature now exists in the field of strategic management that provides many tools to assess the capabilities of both actual and potential competitors.\textsuperscript{41} And ignoring this type of analysis in high-technology markets has the potential to result in erroneous determinations that do not contribute to competition and consumer welfare.

5. Conclusions

Qualcomm submits that an economically sound analysis of market power in high-technology industries must take into account the vigor of dynamic competition. In many such industries, leading firms are permanently vulnerable to market entry triggered by drastic innovation and the ability of new firms to enter the market imposes significant constraints on the incumbents.

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