MARKET DEFINITION OF MULTI-SIDED PLATFORMS IN EUROPEAN UNION COMPETITION LAW: THEORY AND PRACTICE

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Market definition of multi-sided platforms in European Union competition law: Theory and practice

Multi-sided platforms are firms which, by acting as intermediaries, enable interaction of distinct but related consumer groups. They operate on two-sided markets that are characterised by indirect network effects and create added value by internalising these network effects. The Internet and the development of information and communication technology have contributed to their growth and today the most valuable firms in the world by market capitalisation are platforms firms. Despite the vast economic literature, the effects of platforms to competition law, however, remain ambiguous.

In my thesis, I study multi-sided platforms in the European Union competition law. By using methods of law and economics, I focus especially on the question of how the relevant market in two-sided markets should be defined for the purposes of assessment of market power and competitive effects. I present the economic theory underlying competition law and two-sided markets and, in the light of that theory, discuss the role and tools of market definition in antitrust analysis of platforms. I further analyse the Court of Justice's seminal rulings in *Groupement des cartes bancaires* and *MasterCard*, which concerned the two-sided nature of payment card systems, and discuss their implications for the EU competition law.

Although the Court of Justice has not explicitly discussed market definition in two-sided markets, its case law leaves no doubt that the two-sided nature of platforms matter for their competitive analysis under the EU competition rules. I propose that the European Commission should clarify its practice on certain questions of market definition relating particularly to when a 'single' two-sided market and when two separate but 'interrelated' markets should be defined, how to adjust the SSNIP test to take network effects into account and how to define the relevant market in the presence of a zero price on one side of the platform. I present my own recommendations for these practices and contribute to the debate on the subject which is currently of particular interest as the Commission is renewing its Notice on Market Definition.

Keywords:
EU law, competition law, restraints of competition, economic analysis of law, industrial organisation, platform economy, two-sided markets, network effects

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Market definition of multi-sided platforms in European Union competition law: Theory and practice

Monenpuoliset alustat ovat yrityksiä, jotka toimien välittäjinä mahdollistavat erillisten mutta toisistaan riippuvaisten kuluttajaryhmien välisen vuorovaikutuksen. Ne toimivat kaksipuolisilla markkinoilla, joilla on epäsuoria verkostovaikutuksia, ja luovat lisäarvoa sisäistämällä nämä verkostovaikutukset. Internet sekä tieto- ja viestintätekniikan kehitys ovat myötävaikuttaneet niiden kasvuun ja nykyään markkina-arvoltaan maailman arvokkaimmat yritykset ovat alustayrityksiä. Laajasta taloustieteellisestä kirjallisuudesta huolimatta alustojen vaikutukset kilpailuoikeuteen ovat kuitenkin yhä moniselitteisiä.

Tutkielmassani tarkastelen monenpuolisia alustoja Euroopan unionin kilpailuoikeudessa. Keskityn oikeustaloustieteen menetelmiä hyödyntäen erityisesti kysymykseen siitä kuinka merkitykselliset markkinat tulisi määritellä kaksipuolisilla markkinoilla markkinavoiman ja kilpailuvaikutusten arvioinnin tarkoituksia varten. Esittelen kilpailuoikeuden ja kaksipuolisten markkinoiden pohjana olevan talousteorian ja keskustelen sen valossa markkinamäärittelyn roolista ja välineistä alustojen kilpailuoikeudellisessa tarkastelussa. Analysoin lisäksi unionin tuomioistuimen merkittäviä ratkaisuja tapauksissa *Groupement des Cartes Bancaires* ja *MasterCard*, jotka koskivat maksukorttijärjestelmien kaksipuolista luonnetta, ja keskustelen näiden vaikutuksista EU:n kilpailuoikeuteen.

Vaikka unionin tuomioistuin ei ole eksplisiittisesti käsitellyt markkinoiden määrittelyä kaksipuolisilla markkinoilla, sen oikeuskäytäntö ei jätä epäilystäkään siitä, että alustojen kaksipuolisella luonteella on merkitystä niiden kilpailuoikeudelliselle tarkastelulle EU:n kilpailuoikeussääntöjen mukaan. Esitän, että Euroopan komission tulisi selkeyttää käytäntöään tietyissä markkinoiden määrittelyn kysymyksissä, jotka liittyvät erityisesti siihen, milloin ‘yksi’ kaksipuolinen markkina ja milloin kaksi erillistä mutta ‘toisiinsa liittyvää’ markkinaa tulisi määritellä, kuinka SSNIP-testi tulisi muokata huomioimaan verkostovaikutukset ja kuinka relevantit markkinat tulisi määritellä silloin, kun yhdellä puolella alustaa on nollahinnat. Esitän omat suositukseni näiksi käytännöiksi ja osallistun keskusteluun aiheesta, joka on tällä hetkellä erityisen kiinnostuksen kohteena, sillä komissio on uudistamassa tiedonantonsa merkityksellisten markkinoiden määritelmästä.

Asiasanat:
EU-oikeus, kilpailuoikeus, kilpailunrajoitukset, oikeustaloustiede, toimialan taloustiede, alustatalous, kaksipuoliset markkinat, verkostovaikutukset

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Abbreviations

ATM	automatic teller machine
CB	(Groupement des) Cartes Bancaires
CJEU	Court of Justice of the European Union
CLA	Critical Loss Analysis
DG COMP	Directorate-General for Competition
EC	European Community
ECSC	European Coal and Steel Community
EEA	European Economic Area
EEC	European Economic Community
EU	European Union
EUMR	EU Merger Regulation
Euratom	European Atomic Energy Community
HHI	Herfindahl-Hirschman Index
ICN	International Competition Network
ICT	information and communication technology
IP	intellectual property
IPO	initial public offering
MIF	multilateral interchange fee
NCA	national competition authority
OECD	Organisation for Economic Co-operation and Development
OJ	Official Journal of the European Union
R&D	research and development
SCP	structure-conduct-performance (paradigm)
SSNDQ	small but significant and non-transitory decrease in quality
SSNIP	small but significant and non-transitory increase in price
TCE	transaction cost economics
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union
US	United States

1. Introduction

The Internet and the development of the information and communication technology (ICT) during the last thirty years have transformed the lives of billions of people around the world and, with it, the economy and the way companies do business with consumers and each other. The technological, economic and societal impact of this transformation has been so profound that some have dubbed this change 'the Fourth Industrial Revolution' which blurs the lines between the physical, digital and biological spheres.[1] Introduction of new technologies has had a disruptive effect on many markets while marking a way towards a data- and algorithm-driven digital economy.

At the heart of the digital economy are platforms ('two-sided platforms' or more generally 'multi-sided platforms' in terms of economics) which create added value by bringing together different groups of customers that are useful to each other. By this service, platforms enable and facilitate interaction of these groups and decrease their transaction costs. As the number of people and companies using digital platforms have increased, so has their importance to the economy. Today, many of the world's most valuable firms are platform firms. For example, in May 2020, among the top 10 weighted companies in the S&P 500 -index, which includes 500 leading publicly traded companies from different industries in the United States, were six firms with a platform business model: Microsoft, Apple, Amazon, Facebook, Alphabet (Google) and Visa.[2]

There are many features which distinguish platform firms from traditional firms. Instead of operating on conventional markets where producers of goods and their consumers meet, platforms facilitate this interaction, thus operating on 'two-sided markets' in terminology of economics. Two-sided markets do not necessarily involve the Internet but are often enhanced by it. Among others, they include software operating systems, social media platforms, dating services, video game consoles, newspapers, stock exchanges, shopping malls and television and radio stations. Software operating systems, for example, connect users, application developers and hardware manufacturers. The demand of these groups is interdependent. As the number of applications for an operating system increases, the operating system becomes more attractive for the users and hardware manufacturers which in turn makes it more attractive for application

[1] Schwab 2015.
[2] S&P Dow Jones Indices 2020.

developers to develop applications for the operating system. This (positive) indirect network effect increases the value of the platform as the number of its customers increase.

Due to their special features and increased importance in the economy, multi-sided platforms have caught the attention of competition authorities, who promote competition by investigating and preventing anticompetitive practices. Anticompetitive practices usually require that a firm has market power, which is the ability of firms to influence prices and profitably raise them above marginal costs[3] for extended periods of time.[4] Raising prices above marginal costs is generally deemed socially harmful because in the neoclassical economic theory social welfare is maximised in a competitive equilibrium where prices equal marginal costs.[5] In such markets of perfect competition, firms cannot influence prices and have no market power. However, perfect competition is mainly a useful theoretical benchmark which is never observed in the real world because of its restrictive assumptions (e.g. large number of buyers and sellers in the market, perfect information and no transaction costs). Determining perfectly competitive prices can also be very challenging as marginal costs themselves are unobservable and subject to same issues of reliability as the data they are derived from. Consequently, any competitive price in antitrust analysis can only approximate a perfectly competitive price.

Because of the complexities of multi-sided platforms, performing antitrust analysis in two-sided markets is inherently more difficult than in traditional markets. Conventional methods and tools used by competition authorities in analysis of traditional markets may produce incorrect results when used in analysis of two-sided markets. This has created a need to rethink antitrust tools for multi-sided platforms. For instance, the Organisation for Economic Co-operation and Development (OECD) Competition Committee held a hearing in June 2017 in which it invited economists to discuss whether the traditional tools for defining markets, assessing market power and efficiencies and assessing the effects of exclusionary conduct and vertical restraints remained usable in analysis of multi-sided platforms and how might these tools to be adjusted, if adjustments were needed. Based on the discussions and papers presented therein, the OECD published a report in 2018 which contained recommendations how different tools might be used by the competition authorities in competitive assessment of multi-sided markets.[6] However, the debate about the proper way to account for the multi-sided features of platforms in antitrust

[3] Marginal cost is the first derivative of a cost function. Informally, it means the cost of producing one more unit of a good.
[4] Belleflamme and Peitz 2010, p. 41.
[5] See e.g. Feldman and Serrano 2006.
[6] OECD 2018.

analysis continues on as lively as it has been since the formulation of the theory of two-sided markets in the early 2000's. This thesis is part of that discussion.

In this thesis, I study multi-sided platforms in the European Union competition law. I focus especially on the question of how the relevant market in two-sided markets should be defined for the purposes of competitive assessment. The methodology of the thesis is interdisciplinary. I adopt the law and economics approach to address the topic in a general, theoretical level while also discussing the reasoning of the Court of Justice of the European Union and the European Commission in antitrust cases concerning payment card systems, which arguably have been the most influential type of platforms to the development of competition practice regarding multi-sided platforms.

In the first chapter, I introduce the topic and the structure of the thesis. In the second chapter, I present the economic theory in the fields of industrial organization and two-sided markets and the role of market definition in antitrust analysis. In the third chapter, I provide an overview of the general principles and sources of the EU law and competition law, focusing on restrictive agreements under Article 101 of Treaty on the Functioning of the European Union. In the fourth chapter, I discuss the reasoning of the Court of Justice of the European Union in its seminal judgments involving payment card systems and the implications of those judgments for the EU competition law. In the fifth chapter, I present my conclusions.

2. Economic theory

2.1. *Development of industrial organization theory*

Competition in free markets has been the study of the economics since the days of Adam Smith and his publication of *The Wealth of Nations* in 1776.[7] It was Smith who first proposed that competition between dealers drives prices down to their natural price or, in modern terms, to market equilibrium, benefiting the consumer. Smith also recognised that the interest of the dealers is always in some respect different from the interest of the public and that restricting competition allows dealers to raise their profits above what they would naturally be at the expense of the society. Smith was followed by a generation of British political economists, such

[7] Smith 1976.

as David Ricardo and John Stuart Mill, who promoted free markets and trade to replace earlier mercantilist practices.

The first formal analysis of competition between two firms was conducted by Cournot in 1838.[8] Cournot formulated a mathematical model in which firms independently and simultaneously make decisions on amount they produce. His model leads to an equilibrium in which the profit-maximising firms choose quantities with prices above competitive price. In the Cournot model, the equilibrium price approaches competitive price as the number of firms approaches infinity. In 1883, Bertrand proposed another duopoly model, which was formalised by Edgeworth[9] in 1897, in which the firms independently and simultaneously choose prices instead of amount of production.[10] The Bertrand model, in contrast to the Cournot model, leads to an equilibrium in which prices equal marginal cost, that is, competitive price. Both models have been highly influential in economics and been later modified and supplemented by other authors.

The benefits of competition and the harmful effects of its restrains were then already well recognised by the classical economists of the 1800's. The industrial revolution transformed western economies, particularly in the United Kingdom and the United States, and gave birth to giant industrial companies and, with them, to new competition problems. At the turn of the 20th century, the first antitrust laws were enacted in the United States to regulate the industrial conglomerates by prohibiting cartels and forming of monopolies when the Sherman Act (1890), the Clayton Act (1914) and the Federal Trade Commission Act (1914) were adopted by the United States Congress. These acts and the case law of the Supreme Court of the United States that followed them still forms the core of modern antitrust law in the United States.

Antitrust law and economics have had a symbiotic relationship: each supports the other. New antitrust laws were based on economic thought from the beginning. The adopting of first antitrust laws, in turn, increased demand for economic study of monopolies and cartels and competitive markets. Industrial economics (later industrial organization), which studies the strategic behaviour of firms and the markets of imperfect competition, became eventually its own discipline within economics. Legal scholar and judge Bork has described this relationship between antitrust law and economics in words "antitrust is, first and most obviously, law" but

[8] Cournot 1838.
[9] Edgeworth 1897.
[10] Bertrand 1883.

it "is also a set of continually evolving theories about the economics of industrial organization".[11]

One of the important developments of the early industrial economics includes Chamberlin's studies of the monopolistic competition. In 1933, Chamberlin presented a formal model in which firms engage in monopolistic practices.[12] Even when there are multiple firms in a market, firms can become monopolists through product differentiation. Differentiated products are not perfect substitutes for each other. Because a monopoly is the only producer of a certain (differentiated) good, it can choose prices at its discretion. Monopolies therefore exercise significant market power (also called monopoly power in this context). The model results in an inefficient equilibrium in which marginal cost of the monopoly equals its marginal revenue. Chamberlin's model demonstrates how monopolies have an incentive to maximise their profits by producing less of a good at a higher price than would be produced in competitive markets.

Chamberlin established the base for the rise of the structure-conduct-performance (SCP) paradigm which was the dominant industrial organization theory for thirty years, from the 1940's until the 1970's. SCP paradigm was promoted by structuralist economists (originally) from Harvard University. The most prominent of these economists were Mason and Bain. Mason emphasised that the structure of the market is fundamental in explaining differences in competitive practices in different markets.[13] Bain proposed that the market structure in many markets is characterised by high barriers to entry, such as entry costs, economies of scale and product-differentiation advantages, which reduce competitiveness and performance of the market.[14] It was hypothesised that high entry barriers exist especially in capital-intensive, research and development (R&D) -intensive and advertising-intensive industries.

The SCP paradigm thus focused on examining the market structure and entry barriers. Its thesis was that there is a causal relation between the market structure, conduct of firms and their performance.[15] The market structure defines conduct of firms which, in turn, defines the performance of the market. The performance and conduct of firms, on the other hand, can influence market structure, and public policy can influence all of these elements.

[11] Bork 1993, p. 10.
[12] Chamberlin 1933.
[13] Mason 1939.
[14] Bain 1956.
[15] Bain 1959.

SCP paradigm condemned monopolies and believed that monopolistic competition and monopoly power was common. Its concern was that dominant firms could use pricing, vertical restrictions and intellectual property (IP) licensing practices to exclude other firms from profitable markets. Some structuralists also believed that market power gave firms leverage which they could use to expand their dominant position in one market into other markets. Influenced heavily by structuralist antitrust thought, antitrust policy in the United States became hostile towards vertical integration.[16]

SCP paradigm was challenged by the Chicago School economists who promoted a contrary paradigm which built its foundation upon neoclassical price-theoretic models. The Chicago School economists contested the prevalence of monopolies and claimed that their presence was more often alleged than confirmed.[17] According to them, market power could not persist because free entry to markets ensured that any monopolies would be temporary and that markets would remain competitive in the equilibrium. This argument was formalised by Baumol, Panzar and Willig in their contestable markets model. They showed that incumbent firms can make only normal profits when there are no entry or exit barriers, no sunk costs and no cost advantage over potential entrants.[18] The intuition of their model is that, because of no sunk costs and low barriers to entry, the possibility of hit-and-run tactics by entrants drives prices to the competitive equilibrium.

The Chicago School economists remarked that the SCP paradigm allowed another interpretation of monopolies. Large market shares of firms might not indicate exploitation of market power or barriers to entry but rather productive efficiency, such as low costs, achieved by the incumbent firms. The Chicago School economists suggested that there is wide range in the productive efficiency of firms within capital-intensive, advertising-intensive, and R&D-intensive industries.[19] Productive efficiency, rather than high entry barriers, might explain high concentration in these industries.

The position of the Chicago School was not without its problems. It received critique of its own. Stiglitz showed that introducing even a small sunk cost for entrants in the contestable markets model leads to an equilibrium in which the incumbent firm makes monopoly profit.[20] When

[16] Hovenkamp 2010, p. 616.
[17] Reder 1982, p. 15.
[18] Baumol, Banzar and Willig 1982.
[19] Baker and Bresnahan 2008, p. 24.
[20] Stiglitz 1987.

sunk costs exists, markets are no longer contestable. Schwartz, in turn, showed that entry and exit of potential entrants is unprofitable if the incumbent has the ability to change prices rapidly. He remarked that threat of entry is unlikely to be a reliable check on monopolistic behaviour in most markets.[21]

The identification critique of the Chicago School economists, however, proved fatal to the SCP paradigm. As a result, empirical SCP models and methods were largely discarded in economics apart from studies relating price to market concentration. The SCP paradigm encountered problems also in its pursuit in showing correlation between market power and market concentration. These problems were partly caused by use of accounting profit as a measure of market performance.[22] Economics and accounting calculate costs and profits differently which is why accounting rates of return differ from economic rates of return.[23] These differences are caused especially by differences of the two disciplines in valuation of capital, depreciation and advertising and R&D investments, and by use of book values and pre-tax rates of return and lack of adjustment for risk, inflation and debt in accounting.[24] For these reasons, accounting data may not be a reliable substitute for economic performance in analytic economic analysis and accounting rates of return are useful only insofar as they yield information as to economic rates of return.[25]

The third approach to monopoly power was the view promoted by Schumpeter and some free-market economists of the Austrian School. Schumpeter regarded innovation and "creative destruction" an inherent part of the capitalist economy and its evolution. In his theory, the process of creative destruction, which innovation is part of, is the driving force in the economy, incessantly destroying the old and creating a new.[26] Innovation by entrepreneurs disrupts the economic equilibrium and creates new monopolies. Monopolies are thus a natural part of the economy and useful to the society as they promote innovation and investments. Like the Chicago School economists, Schumpeter regarded that individual monopolies were temporary, but not because they would necessary lead to a competitive equilibrium but because they were eventually to be replaced by other monopolies resulting from new innovations. Schumpeter's

[21] Schwartz 1986, p. 55.
[22] Baker and Brenahan 2008, p. 24.
[23] See Fisher and McGowan 1983.
[24] See Perloff et al. 2007, pp. 15-18.
[25] Fisher and McGowan 1983, p. 82.
[26] Schumpeter 1962, p. 83.

ideas have been influential especially in innovation economics, which emphasises the role of entrepreneurs and innovation for the economic growth.

After the Chicago School critique, the project to establish a general theoretical framework of competition in the manner of the SCP approach was largely abandoned. Much of the research in industrial organization focused on new areas, such as empirical studies of markets and transaction costs between and within firms.

Transaction cost economics (TCE) studies market transactions and social costs related to them. TCE builds on the work of Coase and Williamson. In 1937, Coase proposed that firms exist to reduce transaction costs (or marketing costs in his terms) in the market. Without firms, organising production in the market would involve large bargaining costs between the owners of the factors of production. An authoritative decision-making structure of a firm removes the need to bargain and reduces these costs. Organising production within firms, however, involves costs as well. Coase therefore suggested that firms tend to expand until the costs of organising an extra transaction within the firm equal the cost of carrying out the same transaction in the open market.[27]

Another major contribution of Coase was his theorem (as named by later authors) which he presented in 1960.[28] Coase theorem states that if externalities[29] can be traded and there are no transaction costs, an efficient allocation of resources can be achieved by bargaining. The initial allocation of property rights does not then affect the efficiency of the outcome. However, the important remark of the Coase theorem is that, because transaction costs are never zero in the real world, transaction costs (and hence, the initial allocation of property rights) matter for the efficient allocation of resources:

> "Once the costs of carrying out market transactions are taken into account it is clear that [...] a rearrangement of rights will only be undertaken when the increase in the value of production consequent upon the rearrangement is greater than the costs which would be involved in bringing it about."[30]

[27] Coase 1937, p. 395.
[28] Coase 1960.
[29] 'Externality' is an external effect which is present when the utility of an individual depends not only on his own activities but on the activities of other individuals as well (Buchanan and Stubblebine 1962, p. 372). Externalities can be positive or negative. For example, scientific research creates positive externalities as it increases the knowledge of all mankind and pollution creates negative externalities as the whole society suffers from the deterioration of the natural environment that pollution causes.
[30] Coase 1960, pp. 15-16.

Myerson and Satterthwaite have proven a strong impossibility theorem, similar to the more informal Coase theorem, which states that with imperfect information (i.e. one party does not know what other party knows), there can be no *ex post* efficient trading mechanism for a transaction of two parties (a buyer and a seller).[31] This means that Coase theorem does not hold under imperfect information. Transactions between two parties hence always involve some inefficiencies which result from parties using their private information for their own gain. However, in a larger market, when there are more than two parties, inefficiencies asymptotically disappear (as the number of transacting parties approaches infinity).[32]

If Coase is the grandparent of TCE, its parent is Williamson, who promoted the idea that transaction costs should be the basic unit of microeconomic analysis.[33] Williamson analysed organisation of economic activity within and between markets and hierarchies and proposed that vertical integration is typically justified because it creates efficient (albeit complex) hierarchies and reduces transaction costs of production such as bargaining and monitoring costs.[34] Contracts in vertical relationships of production become very complex and involve high transaction costs, which is why vertically integrated firms are often a more efficient form of governance in these instances.

The contribution of TCE to antitrust thought has been that it has bridged the gap between industrial organization and organizational economics and established that vertical integration can be socially beneficial and create efficiencies. This has resulted in a more positive attitude toward vertical mergers and acquisitions in antitrust policy in the United States and Europe.

Since the 1970's, perhaps the most important development in the field of industrial organization has been the rise of game theory and its use in the study of the strategic behaviour of firms in markets. Game theory is a branch of applied mathematics which studies the strategic interaction of rational utility-maximising decision-makers ('players') in situations where the actions of one player depend on the actions of other players. This is the case in many imperfect markets, as in oligopolies, where there are at least two firms, which have market power, and whose common decisions affect prices. In making such decisions on production and prices, the profit-maximising firms have to properly account for the similar decisions of other firms. This

[31] Myerson and Satterthwaite 1983.
[32] Rustichini et al. 1994.
[33] Hovenkamp 2010, p. 623.
[34] Williamson 1975.

strategic dimension of imperfect markets makes game theory a natural method to model competition in these instances and a useful tool in antitrust analysis.

Game theory is based on the expected utility theory developed by von Neumann and Morgenstern. Von Neumann-Morgenstern utility theorem states that, under certain conditions and with assigned probabilities for different outcomes, utility functions can be formed from the individual's preferences for these outcomes.[35] The theorem makes it possible to compare the different choices of an individual by their expected utility in numerical form.

In 1951, Nash formulated a solution concept, Nash equilibrium, to solve non-cooperative games in which commitments of the players outside the game are not binding. In a Nash equilibrium, the players' strategies are best replies to each other. This means that no player has an incentive to unilaterally deviate from a Nash equilibrium. Nash showed that there exists a mixed-strategy Nash equilibrium for every finite game.[36] However, there may be multiple Nash equilibria in a game, and, in these cases, it is usually not clear which equilibrium is the one where the players end up to.

The most famous example of a non-cooperative game is Prisoner's Dilemma, in which two prisoners are suspected of a crime. The prosecutor does not have enough evidence to charge them for a crime they are suspected of. The prosecutor, however, has enough evidence to charge them for a minor offence. The prosecutor interrogates prisoners separately. Each prisoner is offered a choice to confess the crime and testify against the other prisoner. If one prisoner confesses and testifies against the other but the other does not, the prisoner that confessed receives a minimum sentence while the other prisoner receives a considerably longer sentence. If neither confesses, prisoners are charged for a minor offence. If both confess, however, they both receive a long sentence. In this game, the Nash equilibrium strategy for each prisoner is to confess the crime although both prisoners would be better off by staying silent and not confessing the crime to the prosecutor. This outcome results from prisoners not being able to trust each other when they are interrogated separately.

[35] Neumann and Morgenstern 1944.
[36] Nash 1951. 'Strategy' means a set of actions for every contingency in a game. 'Mixed-strategy Nash equilibrium' means a probability distribution over a set of "pure" strategies. For example, a choice to turn either left or right in a crossroads can be considered a choice between two pure strategies, and flipping a coin between these options can be thought of as a mixed strategy (by assigning 50 percent chance to turn left and 50 percent chance to turn right).

Game theory has widely transformed the economics. It has been incorporated into almost every aspect of mainstream microeconomics, including the field of industrial organization. Cournot equilibrium, for example, can be shown to be a special case of Nash equilibrium. Game theory has been applied, *inter alia*, successfully to the study of monopolistic and oligopolistic competition, barriers to entry, horizontal and vertical mergers, R&D investments, product differentiation and advertising and analysis of implicit collusion.[37] For instance, it has been shown using game theoretic models that entry barriers do not result from costs only, as proposed by Bain and structuralists, but that they have roots in strategic interaction as well as in costs.[38]

Modern empirical research in industrial organization utilises structural econometric models and micro-level statistical data on specific markets. Structural econometric models combine explicit economic theories with statistical models. The economic theory makes statements about how observable 'exogenous' explaining variables affect 'endogenous' explained variables after which a statistical model is derived from that theory by adding statistical assumptions.[39] Factors that have contributed to the use of structural models and micro-level data include the decline of the SPC paradigm which coincided with Lucas critique in macroeconomics in the 1970's. Lucas critiqued Keynesian macroeconomists for using highly aggregated historical data when studying relationships between macroeconomic variables, such as economic output and investment.[40] Lucas remarked that Keynesian models of that time were not structural, that is, their underlying parameters were subject to change whenever economic policy changed, and that making predictions based on aggregated data without specifying the underlying parameters properly would produce inconsistent statistical estimates. Rather similar problems of interpretation lead to the decline of the SCP paradigm, as noted before. Following Lucas critique, macroeconomics began to establish itself upon microeconomic foundations by using behaviour of households as a basis of macroeconomic models. Likewise, empirical research in industrial organization moved away from the use of aggregated statistical macro-level data towards the use of micro-level market-specific data.

Example of a non-structural (or reduced-form) econometric model is the Phillips Curve which famously describes the relationship between rates of change of wages and unemployment.[41] Using historical data from the United Kingdom in 1861-1957, Phillips empirically

[37] Lambertini 2006, p. 408.
[38] Baker and Bresnahan 2008, p. 24.
[39] Reiss and Wolak 2007, pp. 4281-4282.
[40] Lucas 1976.
[41] Phillips 1958.

demonstrated a negative correlation between these variables: when the change of wages increases, unemployment decreases, and vice versa. The same relationship exists also (trivially) between inflation and unemployment.

The Phillips Curve implies that governments wishing to reduce unemployment should increase inflation. However, the problem with this conclusion is that the Phillips Curve is not time- or policy-invariant. The underlying parameters of the curve are not constant but subject to change. If monetary authorities increased inflation in hopes to influence the unemployment rate, firms would modify their inflation expectations accordingly to take into account the rising wages and hire fewer employees than they would with lower inflation. The relationship between inflation and unemployment can also be different in different times. Indeed, it is generally accepted that while there may be short-term correlation between inflation and unemployment, inflation has no permanent impact on unemployment. This means that the long-run Phillips Curve is a vertical line.

Without added assumptions, the results of statistical models are usually open to different interpretations. This is especially true in empirical economic research where data is typically nonexperimental and all variables are not controllable.[42] Reduced-form models capture the statistical relationship between different variables but their interpretation depends on the assumptions. Some assumptions are necessary for a linear regression model to have a causal economic interpretation as a production function, for example. Indeed, it is well-known in statistics that correlation does not imply causation. Typically, in empirical industrial organization research and antitrust analysis, however, researchers are interested in causal relationships such as how much a merger of two firms affects market prices compared to the alternative that the merger did not happen. Structural models allow these sorts of counterfactuals to be performed and they permit estimation of unobserved parameters, such as marginal costs, that could not otherwise be determined from nonexperimental data.[43]

In conclusion, industrial organization have so far failed to provide a comprehensive theoretical framework of competition for the guidance of competition policy that would be applicable in most situations. As there are no general theory, which captures most of the relevant aspects of competition between firms, each case must be modelled and investigated separately. On the other hand, this *ad hoc* modeling frees the researcher to concentrate on the merits of the specific

[42] Reiss and Wolak 2007, p. 4301.
[43] Ibid, p. 4288.

models, that is, how well a model explains the specific phenomenon the researcher is interested in.[44] The lack of a general theoretical framework and the multitude of different tools allows flexibility for the competition authorities and courts as well in applying antitrust law in the European Union and other jurisdictions.

2.2. *Theory of two-sided markets*

Traditional industrial organization theory, which have been discussed above, concern competition between firms that operate in conventional one-sided markets, where producers and consumers engage in trade of goods and services. The same concerns most of the case law of courts and practice of competition authorities. However, the development of the information and communication technology and the rise of the Internet in recent decades have reduced costs of interaction and dissemination of information between people. This has created new markets, where strong network effects are present, and business models which try to capture these network effects by operating digital platforms.

Economists call markets that involve distinct but related consumer groups with interdependent demand 'two-sided markets' and platforms that intermediate the interaction of these consumer groups 'two-sided platforms' or, in a case of more than two consumer groups, 'multi-sided platforms'.[45] Two-sided markets are characterised by indirect network effects which are externalities that arise from the interaction of the consumer groups. In general, network effects may be direct or indirect. 'Direct network effects' arise when the value of a product to a consumer depends on the number of other consumers using that product. For example, the utility that a consumer derives from joining a telephone network depends directly on the number of other consumers using that network. 'Indirect network effects' in turn arise when the value of a product to a consumer depends on the number of other consumers using a complementary product. For example, the utility that a consumer derives from purchasing a computer depends indirectly on the number of other consumers using that computer since the amount and variety of software developed for that computer hardware depends on the number of computers that have been sold.[46] Indirect network effects are sometimes also called 'cross-platform network effects' in the context of two-sided platforms since those indirect network effects operate across the two sides of the platform.

[44] Shy 1995, p. 5.
[45] As is noted by OECD 2009, p. 23, insights concerning two-sided platforms generalise to multi-sided platforms. Hence, these two terms are treated interchangeably in this thesis.
[46] See Katz and Shapiro 1985, p. 424.

Two-sided markets became its own field of research when Rochet and Tirole published a working paper version of their article *Platform Competition in Two-Sided Markets*[47] in the early 2000's. In that paper, they formed a basic theory of two-sided markets and showed that, to succeed, platforms must get both sides of the market on board by choosing an optimal price structure instead of only an optimal price level. This pioneering work inspired further theoretical research, most notably from Caillaud and Jullien[48], Armstrong[49] and Weyl[50] and from Rochet and Tirole[51] themselves. For example, Caillaud and Jullien showed that an equilibrium with efficient market structure always exists under the assumption of efficient allocation of surplus. They also discussed business strategies such as a "divide-and-conquer" strategy in which one side of the market is subsidised while profits are made on the other side.[52]

Today, the economic literature on two-sided markets includes hundreds of published papers and several major books. It has become a part of the mainstream industrial organization literature.[53] Nevertheless, there are also profound questions which remain open. For example, there is no consensus on the definition of a two-sided market.[54] Rochet and Tirole suggest that a market is two-sided if not only the price level but also the price structure matter for the volume of transactions:

> "[A] market is two-sided if the platform can affect the volume of transactions by charging more to one side of the market and reducing the price paid by the other side by an equal amount; in other words, the price structure matters, and platforms must design it so as to bring both sides on board. The market is one-sided if the end-users negotiate away the actual allocation of the burden (i.e., the Coase theorem applies); it is also one-sided in the presence of asymmetric information between buyer and seller, if the transaction between buyer and seller involves a price determined through bargaining or monopoly price-setting, provided that there are no membership externalities."[55]

[47] Rochet and Tirole 2003.
[48] Caillaud and Jullien 2003.
[49] Armstrong 2006.
[50] Weyl 2010.
[51] Rochet and Tirole 2006.
[52] Caillaud and Jullien 2003, pp. 323-324.
[53] Evans and Schmalensee 2018, pp. 5-6. For a survey of the literature, see Evans and Schmalensee 2014.
[54] Katz and Sallet 2018, p. 2148.
[55] Rochet and Tirole 2006, pp. 664-665.

The Coase theorem not applying is thus a necessary but not sufficient condition for a two-sided market. This means that the market is not necessarily two-sided if the Coase theorem did not apply. If the Coase theorem did apply, however, the price structure of the platform would be neutral, that is, the price structure would not matter to the economic output of the platform.[56]

Weyl in turn has observed that the classic models of two-sided markets usually have three common features. First, they involve a multi-product firm which provide services to two sides of a market that can be charged different prices. Second, there are cross-platform network effects present in the market: utility of a user depends on the participation of users on the other side of the market. Third, platforms have bilateral market power which means that they are price setters on both sides of the market.[57]

Katz and Sallet have critisised Rochet and Tirole's definition of being too broad and therefore unfit for the purposes of antitrust analysis.[58] However, Katz and Sallet remark that a lack of a consensus definition may not be that important in antitrust analysis because in their view "the potential anti-competitive effects of challenged conduct and the firm's competitive environment, rather than inherently imprecise labels, should be the focus of antitrust analysis".[59] Indeed, the two-sided nature of a market is rather a matter of degree than binary variable: depending on the strength of cross-platform network effects, sometimes it might be a critical feature for competitive analysis and other times it might be irrelevant.[60] Consequently, as Katz and Sallet argue, it would not be sensible to adopt a competition policy that varies according to which label is attached to the platform firm.[61]

Pricing strategies of platforms differ significantly from firms in traditional one-sided markets. In principle, platforms may charge consumers for transactions (usage) or access (membership) or both. A platform may charge membership fees especially if it is unable to charge for usage (for example, because the interaction of the user groups is not be observed), or to recoup its fixed costs by capturing end-user surplus.[62] Rochet and Tirole show that the standard Lerner pricing formula[63] (according to which a profit-maximising monopoly chooses its prices) can be

[56] Ibid, p. 649.
[57] Weyl 2010, p. 1644.
[58] Katz and Sallet 2018, p. 2149-2150.
[59] Ibid, p. 2151.
[60] OECD 2009, p. 28.
[61] Katz and Sallet 2018, p. 2170.
[62] Rochet and Tirole 2006, pp. 651-652.
[63] The Lerner index, as formulated by Lerner 1934, is a firm's percentage markup (a price minus a marginal cost divided by the price). It measures a firm's market power on a scale from 0 (perfect competition) to 1 (monopoly).

reinterpreted in two-sided markets by replacing marginal cost with 'opportunity cost'.[64] With this reinterpretation, pricing in two-sided markets follows the standard Lerner principles.[65] In monopoly settings, platforms subsidise the user group with a high price elasticity of demand[66] and charge more to other groups to attract as many users as possible.[67] Rochet and Tirole call this the "seesaw principle":

> "[A] factor that is conducive to a high price on one side, to the extent that it raises the platform's margin on that side, tends also to call for a low price on the other side as attracting members on that other side becomes more profitable. Accordingly, it is quite common for a platform to charge below-cost (perhaps zero) prices to one side and high prices to the other."[68]

These principles allow platforms to internalise externalities that arise from the interaction of the user groups on different sides of the platform. However, Weyl has shown that, if there is user heterogeneity, these externalities are internalised imperfectly, as only the preferences of marginal users are taken into account by the platforms.[69]

There are also other important aspects, such as user multi-homing, which affect the optimality of the price structure and market outcomes. 'Multi-homing' means that a user uses multiple platforms whereas 'single-homing' means that a user uses only one platform. It is possible that both sides of the platform multi-home or that only one side of the platform multi-homes. Likewise, it is possible that both sides of the platform single-home.[70] In general, homing decisions on one side of the platform depend on homing decisions on the other side of the platform.[71] Armstrong illustrates this with an example that if everyone who speak French as a native language speak also English, then native English speakers have less incentive to learn French.[72]

According to the monopoly pricing formula (see e.g. Belleflamme and Peitz 2010, p. 27), a monopolist firm chooses a price such that its Lerner index is the inverse of the elasticity of demand. However, as elasticity of demand or marginal costs are not observable, it is in practice very difficult to estimate market power by using the Lerner index. The Lerner Index is also problematic in industries with high fixed costs and low marginal costs, such as the computer software industry (see Baker and Bresnahan 2008, p. 35, note 57).

[64] Rochet and Tirole 2006, p. 665.
[65] Ibid, p. 658.
[66] Price elasticity of demand is the responsiveness of the quantity demanded of a good to changes in its price.
[67] See Armstrong 2006, pp. 671-673.
[68] Rochet and Tirole 2006, p. 659.
[69] Weyl 2010, p. 1658.
[70] Armstrong 2006, p. 669.
[71] Franck and Peitz 2019, p. 57.
[72] Armstrong 2006, p. 669.

Multi-homing has significant effects for the platform's pricing power which depends on competitive conditions on both sides of the platform.[73] If one side of the platform single-homes and the other side multi-homes, a competitive bottleneck might be created where the platform holds monopoly power over providing the multi-homing users access to the single-homing users. As in traditional markets, this monopoly power results in higher prices for the multi-homing users. However, these higher prices may not lead to monopoly profits as the platform is forced to compete fiercely for the single-homing users. Thus, profits might be passed on to a significant extent to the single-homing users in the form of low or zero prices.[74] In such a case, single-homing users end up receiving a larger share of the joint surplus than the multi-homing side.[75]

Because of these idiosyncrasies of two-sided markets, the results of orthodox economic theory might not hold in their competitive analysis. For example, welfare effects of price increases in two-sided markets cannot be established without considering also network effects. Song has simulated effects of mergers between media platforms by using data on TV magazines in Germany from 1992 to 2010 and shown that mergers in these markets are less harmful to readers and advertisers than what a one-sided market model would predict.[76] As magazines typically set copy prices for magazine readers below marginal costs and make profits from advertising, platforms are usually expected to charge higher advertising fees to advertisers after mergers.[77] Despite higher prices, advertisers are not necessarily worse off if lower copy prices attract more readers and thus increase advertisers' willingness to pay for advertising.[78] This shows that welfare effects of changes in the price structure are not necessarily negative even for those user groups of a platform that suffer from price increases but they rather depend on the presence of network effects and their sign and magnitude.

Wright discusses eight basic fallacies that can arise from using conventional wisdom from one-sided markets in two-sided markets.[79] He uses (heterosexual) nightclubs as an example to illustrate these questions as they exemplify many qualities of two-sided markets. Nightclubs, much like online dating services, facilitate meeting of two different types of customers, in this case men and women. In addition, their markets are often competitive, as there are usually many

[73] Evans 2003, p. 359.
[74] Armstrong 2006, pp. 669-670.
[75] Rochet and Tirole 2003, p. 660.
[76] Song 2019.
[77] Ibid, p. 39.
[78] Ibid, p. 7.
[79] Wright 2004.

nightclubs in any given area. Setting them up is also quite straightforward, as there are only small barriers to entry and exit.[80]

Wright notes that one trait of nightclubs is that users may not only prefer more of the opposite type of users, but they may also prefer less of the same type of users.[81] This means that men prefer nightclubs with more women and less men as patrons while women conversely prefer clubs with more men and less women as patrons. Network effects then are such that increase in the number of the opposite type incurs a positive externality for a given type whereas increase in the number of the same type incurs a negative externality.

The first fallacy is that an efficient price structure should be set to reflect relative costs.[82] This is also known as the *user-pays* principle. It means that a user pays all the costs of the product or service which is consumed. In the case of nightclubs, the cost of service for men and women are likely to be equal. Hence, under the user-pays principle, men and women should pay the same fee for entry. In jurisdictions where it is legal, however, nightclubs use differential pricing strategies, charging more from men than women to enter.[83] This price discrimination might imply that men, on average, care more about the number of women in the club and value their presence more than vice versa. The magnitude of the network effects is thus different for different groups. If prices for men and women were equal, the expected number of men would be greater or at least as great than the number of women. If women were offered discounted price, however, more women would show up to a nightclub which would then attract more men, even with higher prices. The user-pays principle thus might not lead to an efficient equilibrium. Wright concludes that efficient structure of fees reflects network effects and surplus that different groups derive instead of only relative costs.[84]

Wright also notes that a general theoretical result of economics, which states that prices equal marginal cost in competitive markets, might not hold in two-sided markets.[85] Even if there were many nightclubs in a competitive market with no legal restraints for pricing, the structure of fees for men and women might still be different which would suggest that price for men is above and price for women is below marginal cost. Competition between platforms thus does

[80] Ibid, p. 46.
[81] Ibid, p. 46, note 2. Wright also remarks that homosexual nightclubs are an example of a normal one-sided network as their patrons are interested only in their own type and do not care about the opposite type.
[82] Ibid, p. 47.
[83] Ibid, p. 46, note 3.
[84] Ibid, p. 47.
[85] Ibid, p. 47.

not affect structure of fees and might not lead to an equilibrium in which the prices would equal marginal cost.

The second fallacy that Wright discusses is that a high price-cost margin indicates market power.[86] An observation that nightclubs set prices for men above marginal cost might lead to a conclusion that nightclubs have market power over men. Wright remarks that this is a false identification of market power. Identifying market power based on a price-cost margin is problematic in case of two-sided markets because the assumed presence of market power does not necessarily relate to any restriction of output, ability to restrict competition, more general market failure, or any deviation from the perfectly competitive benchmark for nightclubs. In order to show the existence of market power, one would need to take into account both sides of the market and show that the sum of fees to men and women could be profitably raised above the sum of costs of service to both of them.[87] This conclusion leads directly to a third fallacy Wright discusses.

The third fallacy is that a price below marginal cost indicates predation.[88] Predatory pricing, in which a firm tries to drive a competitor out of the market by setting a very low price, is considered anticompetitive behaviour in many jurisdictions. Sometimes merely expected predatory behaviour from an incumbent firm might create a barrier to entry to the market for new entrants. A price that is set below marginal cost permanently is often presumed predatory in antitrust law. Below-cost prices in case of two-sided markets, however, may be used to generate greater surplus by attracting those kinds of users that provide greater benefits to the other users.[89] It is customary for platforms to subsidise one side of the market at the expense of the other in order to maximise the value of the platform. Based on this common price discrimination, it would be unreasonable to conclude that low prices on one side of the market indicate predation.

The fourth fallacy is that an increase in competition necessarily results in a more efficient structure of prices.[90] As was already noted above in case of nightclubs, increased competition may not affect the structure of prices at all. Rochet and Tirole have shown that under assumptions of linear demand and non-strategic behaviour, the price structure of a monopoly

[86] Ibid.
[87] Ibid, p. 48.
[88] Ibid.
[89] Ibid.
[90] Ibid.

platform and multiple competing platforms is the same.[91] It is not clear that competition between platforms will result in an efficient price structure. Wright notes that while competition will generally lower the total level of costs charged to different sides of the market, it will not necessarily lower the price charged to one side relative to the other side.[92]

The fifth fallacy is that an increase in competition necessarily results in a more balanced price structure. As with the fourth fallacy, the outcome of competition is uncertain. Competition between platforms could lead to a more balanced price structure or then it could not. The outcome depends on demands and types of users.[93] The effects of competition thus must be analysed separately in each case.

The sixth fallacy is that in mature markets (or networks), price structures that do not reflect costs are no longer justified. According to this fallacy, pricing below cost for some types of users may be justified when the platform is starting up and needs to get both sides of the market on board but that such pricing is no longer justified when the platform is well established.[94] Indeed, nightclubs and shopping malls, among other two-sided markets, use promotional offers when they open to attract new customers and to overcome the chicken-and-egg problem.[95] However, differential pricing structures might be efficient for the market afterwards as well, as was discussed earlier, which renders the argument fallacious.

The seventh fallacy is that where one side of a two-sided market receives services below marginal cost, it must be receiving a cross-subsidy from users on the other side.[96] A cross-subsidisation means that one group of customers is charged higher price so that the prices of another group could be lowered. In cross-subsidisation, one group is thus favored at the expense of the other. If men pay more than women to enter a nightclub then one might (fallaciously) conclude that men are cross-subsidising women. Wright remarks, however, that if there was such a cross-subsidy flowing from men to women, it would necessarily result in that men would be better off if women were banned altogether from the nightclub. This move would, of course, reduce revenues of the nightclub and likely drive it out of business as a rival nightclub could be set up to profitably undercut it. The logic of the fallacy ignores the interdependence and network

[91] Rochet and Tirole 2003.
[92] Wright 2004, p. 49.
[93] Ibid.
[94] Ibid.
[95] Ibid, note 9.
[96] Ibid, p. 50.

effects between different groups. Because of these factors, the revenue from each group will cover their incremental costs, and hence there is no cross-subsidisation.[97]

The eight fallacy is that regulating prices set by a platform in a two-sided market is competitively neutral.[98] A regulation of a firm is competitively neutral if it does not provide any competitive advantage for rival unregulated firms. Price regulation in traditional industries, which are sufficiently competitive, may be competitively neutral because when regulation reduces prices of one firm, for example, then other firms must follow it by reducing their prices or lose customers. In case of regulation of two-sided markets, however, an unregulated platform may not wish to adopt the pricing structure of the regulated platform, if the latter is suboptimal. This may provide the unregulated platform a competitive advantage in relation to the regulated platform.[99]

2.3. *Market definition in antitrust analysis*

The assessment of market power in antitrust and merger analysis typically begins with the definition of the relevant market. Market definition is not an end itself but rather "a tool in the investigation of market power".[100] According to OECD Roundtable on *Market Definition*, it serves to identify the strength of the competitive constraints a firm faces and to assess the existence, the creation or the strengthening of market power and the likelihood of possible anticompetitive effects.[101] International Competition Network (ICN) Merger Working Group has likewise noted that market definition is important firstly because "the exercise of defining markets provides a useful analytical framework in which to organise the analysis of the effects of the merger on competition" and secondly because "market shares - the most widely used proxy for the determination of the absence or possible existence of market power - can be calculated only after the scope of the market has been defined".[102]

Ferro has noted that "economists tend to see market definition as a necessary evil, an imperfect instrument to arrive at an end which would, ideally, be reached through methods of direct assessment of market power".[103] Indeed, as academic economists have developed a number of

[97] Ibid.
[98] Ibid, p. 51.
[99] Ibid.
[100] Easterbrook 1984, p. 22.
[101] OECD 2012, p. 29.
[102] ICN 2006, Worksheet A, para 4.
[103] Ferro 2019, p. 2.

econometric techniques for measuring market power[104], direct evidence has become an important alternative to the traditional method of inferring market power from market shares.[105] However, as direct methods usually use estimates of demand elasticities, which are difficult to determine precisely in practice due to constraints of time and data, competition authorities are often forced to rely on indirect methods for assessing market power.[106] Market delineation is useful for this purpose because the relevant market separates active forces of competition from passive forces in the background, thus in principle capturing that which is relevant for the competitive analysis.[107]

However, use of market shares as a proxy for market power is highly problematic in two-sided markets.[108] Even in one-sided markets, market shares do not account for the dynamic nature of markets and entry of potential competitors. Especially in technology-intensive industries, market shares might overstate market power of a firm which has a high market share but is vulnerable to dynamic entry.[109] Typically, market shares are used to provide an indication of the market structure and also to calculate market concentration measures and competition indices, such as the Herfindahl-Hirschman Index (HHI)[110]. A theoretical justification for the HHI (and market shares) is that in the Cournot model of competition in which firms produce a homogeneous product and simultaneously choose an amount of production there is a positive correlation between market concentration and market power as measured by the Lerner index, that is, a firm's percentage markup.[111] The standard Cournot model and its conditions obviously do not apply to two-sided platforms whose pricing power on each side of the platform depends on competitive conditions on both sides.[112] Moreover, it is not clear how revenue-based market shares should be measured or interpreted in case of zero prices on one side of the platform.[113] For these reasons, competition authorities should focus their efforts on examination of other factors contributing to market power such as barriers to entry, especially as network effects might often form such a barrier to entry in two-sided markets.[114]

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[104] See e.g. Bresnahan 1989 for a survey of econometric techniques for estimating market power which do not rely on market definition.
[105] Baker and Bresnahan 2008, p. 15.
[106] OECD 2012, p. 26.
[107] Werden 2012, p. 739.
[108] Evans 2003, p. 359.
[109] Whish and Bailey 2018, p. 7.
[110] HHI is a sum of the squared market shares of all the firms in the market and it receives values from 0 (lowest possible concentration) to 10 000 (a monopoly). It gives more weight to firms with large market shares, thus reflecting the contribution of individual firms for market concentration better than some other measures.
[111] OECD 2012, p. 26. See e.g. Cabral 2000, pp. 154-156.
[112] Evans 2003, p. 359.
[113] Franck and Peitz 2019, p. 70.
[114] Ibid, p. 82.

Although market shares might be all but useless for the competitive analysis of many two-sided platforms, market definition might serve that analysis well by providing a framework for it. Market definition has evolved from identifying interchangeability of products based on their characteristics to recognising competitive constraints a firm or a merged firm faces.[115] These competitive constraints, demand and supply substitutability, are imposed upon a firm by consumers or other firms. Demand-side substitution is the most important and immediate of these constraints. Its purpose is to identify products which the consumers view as substitutes for each other. Supply-side substitution, on the other hand, examines whether there are firms that could readily switch their production in short term to substitutable products. Compared to demand substitution, supply-side substitution is of secondary importance in defining relevant markets and it depends from jurisdiction whether it is considered at the market definition stage or later when assessing competitive effects.[116] Considering supply substitution at market definition stage broadens the relevant market and may lead to analytical errors if competitive effects analysis is not conducted carefully.[117] When the relevant market is defined too broadly, it is possible that competitive constraints that in fact do not substantially constrain the behaviour of firms are taken into account and thus market power may be understated. By contrast, when the relevant market is defined too narrowly, there is a risk that important competitive constraints are not accounted for and hence market power may be overstated.[118]

Defining relevant markets includes two parts: determining relevant product markets and relevant geographic markets. The most widely employed test to do this is the 'hypothetical monopolist test' which is also known as the 'SSNIP test'.[119] In this test, a hypothetical monopolist, a producer of goods located in a geographic region, is considered to impose a small but significant and non-transitory increase in price (SSNIP) for its product, typically in the range from 5 to 10 percent. If it is likely that a profit-maximising hypothetical monopolist would impose such an increase in price (the US version) or if such an increase in price is profitable (the EU version), then the products included in this market are considered substitutes for the product in question and the relevant market is defined as the combination of the product and geographic markets. If such an increase is not likely to be imposed or profitable, however, the next closest substitutes are added to the market and the test is repeated until the increase in price

[115] Evans and Schmalensee 2018, p. 12, note 28.
[116] OECD 2012, p. 32.
[117] See Baker 2007, pp. 133-138.
[118] OECD 2012, p. 29.
[119] The precise format of the SSNIP test varies a little between jurisdictions.

is profitable. Ultimately, the relevant market comprises of the smallest set of products and regions in which the price increase is profitable.

The logic behind the SSNIP test is quite intuitive. If even a monopolist could not profitably increase the price above the competitive level, firms which are not monopolists would certainly not be able to do so either. If that is the case, firms will not have any market power and any market shares determined in the market will be meaningless.[120] The SSNIP test thus identifies markets which are worth monopolising. It is useful as a thought experiment or a conceptual tool (as it is most often employed in practice) but even more so as an econometric exercise if data and time are sufficiently available. In the latter case, the SSNIP test often involves estimating a firm's own-price elasticity of demand and comparing it with a critical elasticity of demand which (in the EU) is the value of price elasticity of demand that would leave a monopolist's profits unchanged following a price increase. If the firm's own-price elasticity of demand is less than the critical elasticity, the increase in price is profitable and the relevant market is defined.[121]

An alternative, more popular method to perform the SSNIP test is the 'Critical Loss Analysis' (CLA). CLA estimates the 'critical loss' which is a measure for a firm's loss in sales of a good that would leave its profits unchanged following an increase in a good's price. If the critical loss exceeds the expected loss of sales (the 'actual loss') following an identical price increase, then the increase in price is profitable and the relevant market is defined.[122] Under assumptions of linear or constant elasticity of demand and constant marginal costs, the critical loss formulas are equivalent to critical elasticity formulas in analysis.[123]

The hypothetical monopolist test was first introduced by the US Department of Justice in its *1982 Merger Guidelines*.[124] Subsequently, it has been embraced by the competition authorities all over the world. The European Commission formally established the SSNIP test as part of its market definition practice in antitrust and merger cases in its *Notice on the definition of relevant*

[120] OECD 2012, p. 30.
[121] Franck and Peitz 2019, p. 62.
[122] Filistrucchi et al. 2014, p. 329, note 127.
[123] For a critique on critical loss analysis, see e.g. Katz and Shapiro 2003. For derivation of critical elasticity of demand and critical loss formulas, see Werden 1998, pp. 410-412, Appendix A. It should be noted that slightly different but equivalent versions of the formulas are in use in the EU and the US due to different versions of the SSNIP test used in these jurisdictions (these are called the break-even and the profit-maximisation critical elasticity/critical loss, respectively).
[124] See Werden 2003.

market for the purposes of [EU] competition law (the '*Notice on Market Definition')*[125] in 1997. Despite its usefulness, there are however some circumstances where the SSNIP test (at least without adjustments) may not be an appropriate tool for defining relevant markets.

A well-known problem in application of SSNIP test to monopolisation or abuse of dominance cases is the 'cellophane fallacy', an error of inclusion of false substitutes in the relevant market, which the US Supreme Court committed in *United States v. Du Pont & Co.*[126] in 1956. The case concerned a US company du Pont which produced cellophane, a unique packaging material, the production of which was protected by different patents. During the relevant period of the case, du Pont produced almost 75 percent of the cellophane sold in the United States, while cellophane constituted less than 20 percent of all sales in flexible packaging material. The US Department of Justice had charged du Pont with monopolising the cellophane market in violation of the Sherman Act. Affirming the lower court ruling and against dissenting minority opinion, the Supreme Court concluded that cellophane was interchangeable with other flexible packaging materials, on which basis it defined the relevant market to be the market for flexible packaging materials, and that competition from these other packaging materials prevented du Pont from possessing monopoly power in sales of cellophane.

The mistake of the Supreme Court which lead it to define the relevant market too widely was to ignore the possibility that du Pont was already charging the monopoly price in the cellophane market and that any inferences from this prevailing price level regarding the substitutability of the products in question were biased. To avoid this error, the Supreme Court should have used a counterfactual estimate of competitive price instead. This failure caused the Supreme Court to conclude erroneously that the cross-elasticity of demand[127] of cellophane (at the competitive price level) was high when in fact it was low. Economists Stocking and Mueller, critisising the lower court ruling, pointed out that the relevant market for cellophane was narrower than the flexible packaging materials and that cellophane was so differentiated from other flexible wrapping materials that its cross elasticity of demand gave du Pont significant and continuing monopoly power which du Pont exercised "with foresight and wisdom" in its pricing policies to maximise its earnings.[128]

[125] Commission Notice on the definition of relevant market for the purposes of Community competition law, published in OJ 97/C 372/03.
[126] *United States v. Du Pont & Co.*, 351 U.S. 377 (1956).
[127] Cross-elasticity of demand is the responsiveness of the quantity demanded of a good to price changes of another good.
[128] Stocking and Mueller 1955, p. 63.

The *United States v. Du Pont & Co* case demonstrates well the decisive role market definition often plays in antitrust analysis. Different definitions of the relevant market are likely to lead to different outcomes in cases, especially when great emphasis is given to market shares. This is one of the reasons why market definition has been regularly criticised in the literature. Some authors have proposed that market definition process should be abandoned entirely because in their view meaningful inferences of market power in redefined markets cannot be made nor it is possible to determine what market definition is best without first formulating a best estimate of market power, rendering further analysis pointless and possibly leading to erroneous outcomes.[129] Others have contested these propositions and their premises by arguing that market definition serves a useful purpose of identifying the competitive process at issue rather than simply measuring market shares and that market delineation does not require any prior assessment of market power.[130]

Some markets, however, exhibit special features which must be accounted for when defining relevant markets. This is the case with two-sided markets where market definition is more complicated because of indirect network effects between the groups interacting on the platform.[131]

Firstly, there is the issue of how many markets should be defined. Obviously, there are two sides to a market in a two-sided market but it is not trivial whether one 'two-sided' market or two separate but 'interrelated' markets should be defined. The former is called a 'single-market approach' and the latter a 'multiple-markets approach'. The literature is divided between these approaches with respect to certain types of platforms but not others. For example, in case of advertising-supported media markets, there is a broad consensus that defining two distinct but interrelated markets is preferable to defining a single market.[132] This is mainly due to a reason that products on different sides of the platform may not be substitutes for each other (e.g. reading a newspaper is not a substitute for purchasing advertising).[133] By contrast, there are divergent views regarding transaction platforms, such as payment card systems, which are characterized by the presence and observability of a transaction between the two groups of

[129] Kaplow 2010.
[130] Werden 2012.
[131] OECD 2012, p. 57.
[132] Katz and Sallet 2018, pp. 2154-2155.
[133] Ibid, p. 2142.

users.[134] It has been argued that a transaction provided by these platforms is a service that, by its very nature, must be jointly consumed by two parties and cannot be separately provided to one or the other.[135] The debate between the approaches, then, is not about that the multi-sided markets approach is invalid but whether it should be complemented by the single-market approach in some cases.

Filistrucchi et al. have promoted the single-market approach by proposing that in two-sided transaction markets, only one market should be defined.[136] According to them, defining a single market in this case means defining the market for services to a transaction where the offered product is the possibility to transact through the platform.[137] Conversely, in two-sided non-transaction markets, two interrelated markets need to be defined in accordance with the multiple-markets approach.[138] In both of these cases, competition authorities should take into account both sides of the market when defining the relevant market. Ignoring the other side is acceptable only in a two-sided non-transaction market where that other side exerts no externality on the other.[139]

A result of defining only one relevant market is that a platform would be either on both sides of the market or on none. In case of two interrelated markets, by contrast, it is possible that a platform could be on one side of the market but not on the other.[140] Filistrucchi et al. give as an example a payment card firm:

> "Everyone would probably agree that a payment card company such as American Express is either in the relevant market on both sides or on neither side, for the reason that either the transaction between the buyer and the merchant takes place using American Express services on both sides, or it does not take place through American Express."[141]

Evans and Noel have similarly proposed that a single two-sided market should be defined when the two sides of the market are highly complementary and closely linked and all the other platforms in that industry also serve the same two sides.[142] This description fits transaction-

[134] Filistrucchi et al. 2014, p. 298.
[135] Evans and Schmalensee 2018, p. 10.
[136] Filistrucchi et al. 2014, p. 302.
[137] Ibid, p. 303.
[138] Ibid, p. 302.
[139] Ibid, p. 322
[140] Ibid, p. 301.
[141] Ibib.
[142] Evans and Noel 2008, p. 674.

platforms, such as payment card systems, but also some non-transaction matching platforms, such as (heterosexual) nightclubs and dating services where transactions may not be observable. Following the suggestion of Filistrucchi et al., these markets should be defined as two separate but interdependent markets. However, it does not make sense to talk about separate markets for men and women in this case.[143] The product that a platform offers herein to both sides is the opportunity to find a match. The platform cannot observe whether a transaction takes place and hence cannot charge any transaction fee. Because the product is identical and there are similar substitution possibilities for both sides, it would appear reasonable to define a single two-sided market in these cases.[144] Consequently, basing the choice between the single-market and the multiple-markets approach on whether transactions are observable, as suggested by Filistrucchi et al., simplifies the choice too much.

Katz and Sallet have criticised the single-market approach and proposed that multiple-markets approach should be used in all two-sided market delineation cases, including that of transaction markets. They make two broad arguments against the single-market approach. Firstly, even in transaction platforms, services offered to users on different sides of the platform are generally not substitutes and therefore cannot be in the same relevant market.[145] One reason for this is that the interests of different parties to the transaction may not be fully aligned. In case of credit cards, for example, merchants and consumers have partly divergent interests. Each group is interested only in their own utility (merchants in lowering interchange fees and consumers in increasing their rewards from using a certain card) while neither are interested in the net two-sided price a credit card company charges to them both.[146] Secondly, if a single market is defined, different competitive conditions (such as product differentiation, vertical integration, user sophistication and multi-homing) on the two sides of a transaction platform cannot be taken into account. In credit card markets, for instance, merchants typically multi-home (accepting many different credit cards) whereas consumers often single-home (usually owning only one or two credit cards).[147] It is well-established in the economic literature that platforms compete more fiercely to attract single-homing users than multi-homing users by charging higher prices from the multi-homing side and, to a large extent, passing the profits made on that side to the

[143] Evans and Noel 2005, p. 671.
[144] OECD 2018, p. 13. In Case B6-57/15 *Parship/Elitepartner*, which involved a merger between two online dating platforms, the German competition authority Bundeskartellamt followed a similar line of reasoning and defined a single product market for online dating services for men and women.
[145] Katz and Sallet 2018, p. 2157.
[146] Ibid, p. 2158.
[147] Ibid.

single-homing side in the form of low or zero prices.[148] Therefore, in markets where one side multi-homes and the other side single-homes, it might not make much sense to speak of the competitiveness of the market when there are in fact two markets: the competitive market for single-homing users and a market for multi-homing users where each platform holds a local monopoly.[149]

Franck and Peitz have joined these concerns and claimed that theoretical conditions when single-market approach might work are so severe that these conditions limit its application in practice to rare circumstances. Hence, there is a risk that courts and authorities would apply the single-market approach erroneously. Franck and Peitz hold that the multiple-markets approach is more flexible instrument than single-market approach as it takes into account different market conditions and substitution possibilities on the two sides of the platform which are not captured when a single market is defined.[150] For example, in a ride-hailing platform Uber, which matches drivers and passengers and observes whether transactions between these groups take place, passengers and drivers have different substitution possibilities. Instead of Uber, passengers may use a classic taxi service, their own car, public transport or in some cases they may choose to walk. These substitution possibilities are not available to a driver.[151]

Wismer et al. do not discard the single-market approach entirely but concur that its application seems feasible only if a platform's service necessarily involves all groups on different sides of the platform and if substitution possibilities for each customer group do no differ substantially. Otherwise, the multiple-markets approach is more appropriate.[152] In particular, they hold, it seems more appropriate to define separate markets for each customer group if competitive conditions are significantly different between these groups.[153]

The view of Wismer et al. is consistent with the position taken by the German competition authority Bundeskartellamt (with which they are affiliated) in its *Working Paper on Market Power of Platforms and Networks*, which addresses the issue of market definition in the context of matching platforms and audience-providing platforms.[154] The Bundeskartellamt therein

[148] Armstrong 2006, pp. 669-670.
[149] Ibid, p. 680.
[150] Franck and Peitz 2019, p. 38.
[151] Ibid, p. 26.
[152] Wismer et al. 2017, p. 260.
[153] Ibid, p. 260, note 15.
[154] Bundeskartellamt 2016, pp. 25-32. Bundeskartellamt defines a matching platform as "a platform that enables intermediation between members of two or more user groups tailored to their individual preferences and aspired

adopted the view that defining a single market is suitable for matching platforms if user groups have the same need to interact with each other and if their substitution possibilities do not differ substantially. The reasoning behind this is that the product of a matching platform is indivisible yet always includes both user groups. In these circumstances, considering the different sides of the platform separately would not adequately reflect transactions and the interdependencies between the two sides.[155] However, to the extent that the substitution possibilities are obviously different, separate markets should be defined for user groups.[156] In addition, if there are different competitive conditions on the two sides of the platform (e.g. single-homing users on one side and multi-homing users on the other side), defining separate markets might be justified also in case of matching platforms.[157] Separate markets should also be defined for audience-providing platforms (advertising-financed Internet services in particular), which are generally characterised by asymmetrical indirect network effects between the user groups (i.e. a user side may produce a strong positive indirect network effect to the advertising-side but not necessarily vice versa).[158]

Despite the debate between the single-market and multiple-markets approaches, the definition of the relevant market as a single 'two-sided' market or two 'interrelated' markets may not need to be decisive if the sides and markets are treated interchangeably in the competitive analysis.[159] Many empirical methods of economics for estimating market power do not rely on market definition at all, which is often more important for legal proceedings than economic analysis. Indeed, it should be remembered that market definition is only a tool in the investigation of market power, as reminded by Katz and Sallet:

> "Given that formal market definition is not a prerequisite to sound analysis, one should be wary of arguments that a particular choice of formal boundaries inevitably dooms one to reaching incorrect conclusions. Instead, antitrust enforcers and courts should employ market definition, in accordance with its intended purpose: as a means by which to assist the assessment of market power and competitive harms in conjunction with all of the relevant evidence."[160]

by all user groups" whereas an audience-providing platform is "a platform that enables one user group to attract the attention of another user group" (ibid, p. 21). Transaction platforms are a subgroup of matching platforms.
[155] Ibid, p. 28.
[156] Ibid, p. 29.
[157] Ibid, p. 62.
[158] Ibid, pp. 29-30.
[159] OECD 2018, p. 13.
[160] Katz and Sallet 2018, p. 2153.

That being said, when formal definition of the relevant market is required or helpful for the competitive analysis, the position of the Bundeskartellamt outlined above serves as a good baseline and guidance for deciding between the two approaches when defining the relevant market in two-sided markets. It is clear from the literature that multiple-markets approach should be the default option in most market delineation cases as the theoretical conditions for the use of the single-market approach are rather restrictive (in summary, a platform must offer an intermediation service which requires participation of all user groups and which cannot be offered to these groups separately while substitution possibilities and competitive conditions on different sides of the platform must be similar).

However, when these conditions are fulfilled, the single-market approach should be used instead of the multiple-markets approach. The value of the single-market approach vis-à-vis the multiple-markets approach is that it appropriately captures the nature of an intermediation service as a substitutable product where such a service really is the "product" provided by a platform. Another (more practical) benefit of the single-market approach is that defining a single market simplifies the analysis of competitive effects in already complicated two-sided settings. This may be helpful for competition authorities who are always short on time in their investigations, which is a matter ignored by Katz and Sallet and Franck and Peitz. The purpose of market definition, after all, is to recognize the most important competitive constraints a firm faces which can then be taken into account when assessing market power in later analysis.

Furthermore, a choice between the two approaches cannot be based on a simple categorisation of a platform as a transaction or non-transaction platform, as suggested by Filistrucchi et al., as it is possible to identify transaction platforms, where defining separate markets instead of a single market may be desirable, and non-transaction platforms, where defining a single market instead of separate markets may be preferable. Instead, a more detailed examination of a platform under investigation is required before deciding which approach should be followed.

The second problem, which must be addressed when defining the relevant market in two-sided markets, is related to the SSNIP test which was originally developed for one-sided markets. In two-sided markets, the SSNIP test must be adjusted to account for the network effects present on the platform. Applying the standard single-sided SSNIP test without accounting for the feedback effects might result in definition of too narrow or too large relevant markets,

depending on the sign and size of feedback effects.[161] In the presence of positive cross-platform network effects, a price increase on side A of the platform reduces the number of users on that side of the platform, which in turn reduces the number of users on side B of the platform. This accordingly reduces the number of users on side A of the platform and so on until a new equilibrium is reached. Positive network effects thus increase the substitution effect of price increases and reduce their profitability. Therefore, the use of the standard single-sided SSNIP test in the presence of positive network effects may lead to the definition of too narrow markets. Conversely, the use of the standard SSNIP test in the presence of negative network effects may lead to the definition of too wide markets.

According to Belleflamme and Peitz, there are four different ways of adjusting the SSNIP test for price increases in a two-sided market. These options result from a platform's need to choose both the price level and the price structure. The hypothetical monopolist platform could raise (i) the sum of prices while optimally adjusting the price structure, (ii) all prices together while keeping the price structure fixed, (iii) each of the prices separately allowing the other prices to be adjusted optimally, or (iv) each of the various prices while keeping the other prices fixed.[162]

Filistrucchi et al. suggest that the SSNIP test should be modified in accordance with the option (i) or (iii), depending on whether the two-sided market is a transaction or a non-transaction market, respectively. In a two-sided transaction market, the profitability of an increase in the sum of the prices should be examined whereas in a two-sided non-transaction market the profitability of a rise in price on each side of the market should be checked. Ideally, in both cases the hypothetical monopolist should be allowed to adjust the price structure optimally.[163] If the optimal adjustment is not allowed, the loss in profits resulting from the price increase is overestimated, because by definition the optimal adjustment of the price structure by the hypothetical monopolist should reduce such a loss.[164]

Evans and Noel would also expect a hypothetical monopolist to optimally adjust prices across sides and platforms in line with options (i) or (iii), just as a hypothetical monopolist would optimally adjust products across the firms it controls in a one-sided market.[165] They propose a two-sided critical loss formula to be used in the CLA of platforms which operate on two

[161] Filistrucchi 2018, p. 46.
[162] Belleflamme and Peitz 2010, p. 640.
[163] Filistrucchi et al. 2014, pp. 332-333.
[164] Ibid, p. 332.
[165] Evans and Noel 2008, p. 674.

separate but interdependent markets. Their formula, while taking into account the multi-sided nature of the markets, does not however allow a hypothetical monopolist to optimally adjust the price structure, which, according to Filistrucchi et al., results in the definition of too wide markets.[166] By contrast, Filistrucchi presents some two-sided CLA formulas for "media type" markets, which, albeit being more complex, allow the hypothetical monopolist to make the optimal adjustments to the price structure.[167]

The required adjustments to the SSNIP test are more straightforward in two-sided markets where transactions are observable. Emch and Thompson propose that in case of payment card systems the adjustment can be done by applying the SSNIP test to the total price charged by the platform on both sides of the market when the structure of prices is set optimally via the interchange fee, in accordance with the option (i).[168] Alexandrov et al. similarly show that in two-sided markets with a monopoly matchmaker the SSNIP test can be applied to the sum of participation fees. This is feasible, because when the matchmaker's transaction volume is a function of the sum of its participation fees, it is possible to construct a demand function and derive elasticity of demand for transactions.[169] Likewise, in case of a monopoly market maker, the SSNIP test can be applied to the market maker's bid-ask spread, which reflects relative scarcity of buyers and sellers and competition from local dealers.[170] Alexandrov et al. also show that, under some conditions, the demand elasticity for the matchmaker corresponds exactly to the demand elasticity for the market maker's transaction volume and also to the price elasticity of demand in a one-sided market.[171] Based on the above literature, it seems that the adjustments required by a two-sided SSNIP test are less complicated when defining a single two-sided market than when defining two separate but interdependent markets.

Franck and Peitz propose in turn that option (iv) should be the default option to adjust the SSNIP test but they further add that it should be complemented by option (iii) if price adjustments on the other side of the platform are likely to arise.[172] Katz and Sallet likewise prefer adjusting the SSNIP test first with option (iv) and examining whether there are significant feedback effects

[166] Filistrucchi et al. 2014, p. 332.
[167] Filistrucchi 2008.
[168] Emch and Thompson 2006, p. 59.
[169] Alexandrov et al. 2011, p. 777.
[170] Ibid, p. 807.
[171] Ibid, p. 777.
[172] Franck and Peitz 2019, pp. 63-64.

and then moving on the option (iii) in the presence of strong feedback effects.[173] They follow logic which is analogous with the standard SSNIP test:

> "When assessing the profitability of a SSNIP by a hypothetical monopolist that is a "standard" firm, it is necessary to hold the firm's costs constant; otherwise one risks confusing a price increase triggered by a cost increase with one due to the exercise of market power. Similarly, in the presence of cross-platform network effects, users on one side of a platform can be viewed as inputs to the supply of services to users on the other side, and the cost of that input has to be held constant in applying the Hypothetical Monopolist Test."[174]

Whether the standard or adjusted version of the SSNIP test is used to define the relevant market in two-sided markets and, in the latter case, whichever option is preferred, Filistrucchi et al. suggest that the SSNIP test may provide useful information on the size of the relevant market in any case. For the aforementioned reasons related to positive network effects, a single-sided SSNIP test can provide evidence on the lower bound to the relevant market in a two-sided non-transaction market.[175] The standard single-sided SSNIP test can thus be a useful screen to check whether market power is so minor that there can be no appreciable effect on competition. In context of mergers, Filistrucchi et al. infer that if a merger does not raise competitive concerns in a narrow market defined using a single-sided SSNIP test, it will not raise them in a wider market defined using an adjusted two-sided SSNIP test.[176]

Similarly, Filistrucchi et al. remark that both in two-sided transaction and non-transaction markets a two-sided SSNIP test that does not allow the hypothetical monopolist to optimally adjust the price structure can provide evidence on the upper bound of the relevant market.[177] Not allowing the hypothetical monopolist to optimally adjust the price structure overestimates the loss in profits, which leads to the definition of a too wide relevant market, as was remarked above. This upper bound can serve as another screen for market power in two-sided markets, much like the lower bound of the relevant market found using the single-sided SSNIP test. Filistrucchi et al. remark, again in the context of mergers, that if a merger does raise competitive concerns in a wider market defined using a two-sided SSNIP test which does not allow the

[173] Katz and Sallet 2018, p. 2159.
[174] Ibid, p. 2160.
[175] Filistrucchi et al. 2014, p. 333.
[176] Ibid.
[177] Ibid.

optimal adjustment of the price structure, it will raise them also in a narrower market defined using a two-sided SSNIP test which allows the optimal adjustment.[178]

The justification for allowing a hypothetical monopolist to optimally adjust the price structure is stronger than preventing the hypothetical monopolist from doing so. The SSNIP test draws market boundaries by identifying markets which are worth monopolising. In accordance with the literature, any profit-maximising hypothetical monopolist in a two-sided market would naturally be expected, in addition to increasing the price on one side of the platform, also to optimally adjust the price structure to reduce the loss in participation on the other side of the platform. Otherwise the profits made by the hypothetical monopolist would not be optimal. Because of this theoretical expected behaviour, it would be against the logic of the SSNIP test not to allow the hypothetical monopolist to make the optimal adjustment. Therefore, options (i) and (iii) should be favored instead of options (ii) and (iv) when adjusting the SSNIP test in two-sided markets, and an adjusted SSNIP test should be favored instead of the standard single-sided SSNIP test. The presence of the cross-platform network effects must be recognised and their direction and strength assessed first before deciding how to adjust the SSNIP test.

In practice, however, a two-sided adjusted SSNIP test seem to have been rarely, if ever, applied by the competition authorities.[179] One reason for this might be that data requirements are higher in two-sided than one-sided markets.[180] Even in one-sided market settings, the SSNIP test is not usually applied in its mathematical form because of time constraints and lack of proper data.[181] Moreover, there are often difficulties involved in quantifying the cross-platform network effects econometrically. Available market data does not typically contain sufficient observable variation in a way that would permit a proper econometric estimation of indirect network effects, although it is usually possible to ascertain the presence and sign of the network effects by using qualitative evidence.[182]

Therefore, if market definition is required for the assessment of the competitive effects in a two-sided market in question and the SSNIP test in one form or the other is applicable, then, further adapting the suggestion of Filistrucchi et al. and assuming positive indirect network effects, the SSNIP test could be adjusted iteratively in an algorithmic manner below, which

[178] Ibid.
[179] Wismer and Rasek 2018, p. 62, and Filistrucchi et al. 2014, p. 339.
[180] Wismer and Rasek 2018, p. 62.
[181] Filistrucchi 2018, p. 49.
[182] Wismer and Rasek 2018, pp. 62-63.

approaches the correct relevant market approximately while taking into account increasing data requirements.

As a first step, a standard one-sided SSNIP test (which has the lowest data requirements as it does not require any estimates of indirect network effects) could be performed to check whether, in a narrowest possible market, incumbent platform firms could not be reasonably expected to have significant market power. If there is no reason to suspect the existence of such market power, then further examination of the market in question is unnecessary from the competition law enforcement perspective. However, if there is a reason to suspect the existence of such market power and indirect network effects can be (roughly) estimated, then a two-sided SSNIP test, which does not allow adjusting the price structure optimally, could be performed as a second step to define the widest possible relevant market. If incumbent platform firms could be reasonably expected to have significant market power in these markets, it would be so in a narrower market as well, and there may not be a need to define the relevant market more precisely. However, if there is a reason to suspect that incumbent firms might have market power in a narrow market but not in a wider market, then a more precise market definition may be required and a two-sided SSNIP test, which allows the adjustment of the price structure optimally, could be performed as a third step if proper data and estimates of indirect network effects are available. Then again, the third step could be taken directly as a first step, if data and time are sufficiently well available and market power is suspected already in the beginning.

The third problem related to market definition in two-sided markets is defining the relevant market in the presence of zero prices on one side of the platform. This is typical especially in advertising-supported media markets where platforms attract consumers on one side of the platform by providing them services (such as newspapers, television programs, social networks or search engines) free of charge while charging advertisers on the other side of the platform fees from advertising to consumers. Depending on the circumstances, consumers may also be seen as paying a non-monetary price as a form of attention they dedicate to advertisements, which includes an opportunity cost to consumers, or as a form of data they provide to the platform, which the platform uses to improve its services sold to other customers.[183]

Firstly, it should be noted that a traditional proposition “no price, no relevant market” is false in the context of multi-sided platforms. As is evident from the above discussion, offering

[183] Franck and Peitz 2019, p. 47.

services free of charge for some groups of customers may well be profit-maximising for a platform firm. Due to indirect network effects, different customer groups are likely to affect the behaviour of one another, which is another reason why including non-paying customers to the (same or a separate) relevant market may be justified.[184] Nonetheless, courts and competition authorities in some jurisdictions have previously been reluctant to acknowledge the existence of a market where customers receive goods and services without paying any remuneration.[185] In the EU, the European Commission however has long since adopted a view which recognises that relevant markets may exists even in absence of monetary payments. For example, in its decision in *Microsoft/LinkedIn*-merger case, the Commission acknowledged that the "vast majority of [social networking] services are provided free of monetary charges" but that they "can however be monetized through other means, such as advertising or charges for premium services".[186]

Secondly, the SSNIP test cannot be performed without problems in a market with zero prices. Since the SSNIP test examines the profitability of a price increase of 5 to 10 percent, there can be no such relative price increase when the baseline price level is zero, and therefore the test has no meaningful interpretation in these situations. However, when a single two-sided market is defined, the SSNIP can be applied the sum of prices charged to both sides of the platform even when one side pays a zero price. In these instances, the non-paying customers' reaction to a price increase could be estimated by conducting a survey to discover their willingness to pay.[187]

An alternative to the SSNIP test, originally proposed by Hartman et al.[188], is the 'SSNDQ test' in which a hypothetical monopolist imposes a small but significant and non-transitory decrease in quality (SSNDQ) for its product instead of a SSNIP. Consumers are assumed to prefer higher quality products and to switch to substitute products in response to decrease in quality. Just as in the SSNIP test, these substitutes are then added to the relevant market until the hypothetical monopolist finds the decrease in quality profitable. The merit of the SSNDQ test is that it recognises that price is only one of the dimensions (and perhaps not even the most important one) on which competition takes place. This description is fitting in two-sided markets which

[184] Filistrucchi et al. 2014, p. 300.
[185] For a discussion of case law in different jurisdictions pertaining to this question, see Filistrucchi et al. 2014, pp. 316-319, and Franck and Peitz 2019, pp. 48-53.
[186] Case M.8124 *Microsoft/LinkedIn*, para 87.
[187] Filistrucchi 2018, p. 47.
[188] Hartman et al. 1993.

are often highly differentiated. Platforms are usually differentiated not only by their services but also by their number of users (platforms with more users on another side of the platform being perceived to be of higher quality by users on both sides in the presence of positive network effects).

The SSNDQ test has some major weaknesses though which have reduced its application in practice. Firstly, there are substantial difficulties in establishing objective criteria for quality and measuring its competitive level, especially in highly differentiated product markets. Indeed, Hartman et al. themselves acknowledge that quality, unlike price, is multi-dimensional, and its quantification requires measuring both the change in its individual attributes and the relative importance of these attributes to consumers.[189] Secondly, a hypothetical monopolist might not always have incentive to decrease the quality of its products if the product market is vertically differentiated (i.e. differentiated between different levels of quality). [190] In these markets, some of the customers are willing to pay more for the higher quality products while other customers would rather buy lower quality products at a lower price. A hypothetical monopolist, which cannot distinguish between these consumer types in advance, would not have an incentive to decrease the quality of its higher quality products if this placed them in increased competition with the lower quality products. Instead, a hypothetical monopolist would separate these markets, permitting partial price discrimination and higher profits.[191]

In two-sided markets, the above weaknesses of the SSNDQ test may be lesser than in other markets. Since there is no price competition on the non-paying side of the market, quality may well be the most important dimension of competition and thus a hypothetical monopolist might have an incentive to decrease the quality of its services. As for the appropriate measure of quality, the number of users on different sides of the platform could be an obvious indicator, applicable to all platforms.[192] As was discussed above, this is due to the fact that, in the presence of positive (negative) network effects, users prefer platforms with more (less) users on the other side of the platform and thus regard such platforms to be of higher quality.

Filistrucchi therefore proposes that in some cases, where one side of the platform pays a zero price, a SSNDQ test may be envisaged that would examine the profitability of decreasing quality on the non-paying side of the platform by changing the number of users on the paying

[189] Ibid, p. 339.
[190] Filistrucchi 2018, p. 48, note 34.
[191] See Mussa and Rosen 1978.
[192] Filistrucchi 2018, p. 48.

side. In the presence of positive (negative) network effects, a decrease (increase) in the number of users on the paying side would amount to a decrease in quality on the non-paying side of the platform. For example, in case of television stations, a SSNDQ test could check the profitability of increasing advertising (if it is established that viewers dislike advertising). Similarly to a two-sided SSNIP test, a SSNDQ test in two-sided markets should consider the profitability of decrease in quality and feedback effects on both sides of the platform (the paying and non-paying sides). Filistrucchi further remarks that the quality on the non-paying side of the platform depends also on the price charged to the paying-side of the platform and hence a SSNDQ test would be linked to some extent to the SSNIP test on the paying-side of the platform.[193]

I conclude the discussion on market definition in antitrust analysis with some summarising remarks. The cellophane fallacy demonstrated how important a role market definition may play for the outcome of an antitrust or a merger case in certain jurisdictions. For this reason, market definition often becomes the focus of disputes in antitrust and merger cases in courts, receiving disproportionate amount of attention in the overall competitive assessment.[194] However, the above discussion has addressed some of the specific difficulties involved in market definition of two-sided markets. Because of these problems, it might be advisable for competition authorities to place less emphasis on market definition in competitive analysis of multi-sided platforms where applicable.[195] Competition authorities indeed often leave the question of market definition open where specific definition is not necessary for the analysis of competitive effects or its conclusions, thus avoiding the issues arising from committing into any one definition.

In recent decades, competition authorities and courts in the EU have become increasingly aware of limitations of market definition and adopted a more effects-based approach to competition law, which signals a departure from the old, more formalistic approach in competition practice and case law.[196] Consequently, competition authorities in the EU and elsewhere have adopted new instruments to address these limitations. However, these instruments have been embraced to complement market definition rather than to replace it.[197] Market definition has thus retained its important place in antitrust and merger proceedings in the EU and jurisdictions worldwide.

[193] Ibid.
[194] Baker 2007, p. 129.
[195] OECD 2018, p. 15.
[196] OECD 2012, p. 12. See also e.g. Witt 2019.
[197] OECD 2012, p. 14.

For example, in the EU, market definition is required to calculate market shares for the application of block exemption regulations, which establish a 'safe harbour' for those agreements, decisions and concerted practices of firms that could otherwise be deemed restrictive under the EU competition rules if they did not qualify for a block exemption.

Market boundaries are rarely bright lines in real markets though, especially in highly differentiated product markets where products are imperfect substitutes for each other. This is the reason why the concept 'relevant market' is used in competition law; its purpose is to separate the market under investigation from other, more commonplace conceptions of a market which might be unsuitable for the purposes of a competitive assessment. The relevant market is hence always an abstraction of reality, designed to capture the most important competitive constraints firms face in the market.[198] Nevertheless, relying too heavily on precise market boundaries in subsequent competitive analysis exposes the entire analysis to possible errors committed in the market definition stage, which is certainly something that competitions authorities and courts should avoid.

A good compromise to the debate about the proper use of market definition in antitrust analysis is offered by Evans who have proposed that competition authorities and courts should continue using market definition as a first step of competitive analysis but also recognise that market boundaries are not bright hard lines and put less analytical weight on market shares in general. These steps would serve to "lighten up" competitive analysis where that analysis has previously been overly dependent on hard market boundaries, thus avoiding any "economically unsupported conclusions drawn from artificial market boundaries".[199] This advice is especially fitting in two-sided markets where difficulties and potential problems of market definition are highlighted.

Next, in the third chapter, I will discuss the European Union competition law and its sources, focusing on restrictive agreements under Article 101 of Treaty on the Functioning of the European Union, before turning to discuss, in the fourth chapter, the EU case law concerning payment systems as two-sided platforms. I begin my discussion of the EU competition law by first discussing the general principles and sources of the EU law.

[198] Evans 2012, pp. 57-58.
[199] Ibid, p. 54.

3. European Union competition law

3.1. *General principles and sources of EU law*

The European Union (EU or the 'Union') is a political and economic union of 27 states (the 'Member States').[200] Since the 1950's, it has developed from economic cooperation between six Western European countries into a union of over 500 million citizens covering much of the European continent and focusing, in addition to economy, on diverse political issues such as the climate, environment, defence, security, justice and migration. The European integration has brought peace, stability and unprecedented economic prosperity to the peoples of Europe. The EU has a single currency, the euro, a single monetary policy and is the largest trade block and internal market ('single market') in the world ensuring free movement of goods, services, capital and labor within the EU area.[201]

The legal system of the EU is based on the rule of law. The body of the EU law, *acquis communautaire*, consists of sources of primary law, secondary law and supplementary law.[202] Primary law includes founding and amending treaties, their annexed protocols and accession treaties of the Member States and some supplementary agreements such as the Treaty of Brussels of 1965 (Merger Treaty). Secondary law includes unilateral acts (regulations, directives and decisions) of the EU institutions given under the treaties and international conventions and agreements. Primary law and secondary law are legally binding, written sources of the EU law. Supplementary law, by contrast, contains unwritten sources of the EU law. It includes the case law of the Court of Justice of the European Union (CJEU), international public law and general principles of law. Supplementary law is used by the CJEU when it decides cases where the primary and secondary law alone do not suffice to resolve the issue. Non-binding recommendations, opinions, guidelines and notices of the EU institutions may also have interpretative influence in application of the Union law, depending on the case.[203]

Two main treaties (together, the 'Treaties'), which have been amended by other treaties over the years (most recently by the Treaty of Lisbon, signed in 2007), are the Treaty on European

[200] Until recently, the EU composed of 28 Member States. However, following a 2016 referendum, in which 51,9 percent of the British citizens voted to leave the European Union, and subsequent negotiations with the remaining 27 EU countries and multiple delays and extensions granted by the European Council under the TEU Article 50, the United Kingdom became the first country to withdraw from the European Union on 31 January 2020 ('Brexit').
[201] The European Union 2020.
[202] For a useful summary of the EU law in the official EU law database, see EUR-Lex 2020.
[203] See e.g. Case C-322/88 *Salvatore Grimaldi v Fonds des maladies professionnelles*, EU:C:1989:646.

Union ('TEU', originally Treaty of Maastricht, signed in 1992) and the Treaty on the Functioning of the European Union ('TFEU', originally Treaty of Rome, signed in 1957).[204] The Treaty of Lisbon also made the Charter of Fundamental Rights of the European Union (the 'Charter') a legally binding document and it now has the same legal status as the other EU treaties.[205] In addition to these treaties, there remains in force the Treaty establishing the European Atomic Energy Community (the 'Euratom'), a separate international organisation which is governed by the EU institutions.[206]

The Treaties establish the different EU institutions and their powers. The most important institutions of the Union, as defined in the Treaty on European Union, are the European Parliament, the European Council, the Council (of the EU), the European Commission (the 'Commission'), the Court of Justice of the European Union (the 'CJEU'), the European Central Bank and the Court of Auditors.[207]

The European Council defines the general political directions and priorities for the development of the Union.[208] It consists of the heads of state or government of the Member States, together with its president and the president of the Commission.

The European Parliament and the Council jointly exercise legislative and budgetary functions.[209] Together, they form the legislative branch of the EU. The European Parliament consists of directly elected representatives of the Union's citizens, elected for a term of five years, whereas the Council consists of representatives of Member States at ministerial level, of different configurations. In competition matters, the Council lays down regulations and directives to give effect to the principles of the competition provisions of the Treaties, on a proposal from the Commission and after consulting the European Parliament.[210]

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[204] Article 1(3) TEU. The most recent consolidated versions of the TEU and TFEU were published in OJ 2016/C 202/1.
[205] Article 6(1) TEU. The most recent consolidated version of the Charter was published in OJ 2016/C 202/2.
[206] The most recent consolidated version of the Treaty establishing the European Atomic Energy Community was published in OJ 2016/C 203/1. Euratom is one of the three original international organisations previously forming the European Communities, brought under the same governing institutions in 1967 by the Merger Treaty, the other two organisations being the European Coal and Steel Community (ECSC) and the European Economic Community (EEC), which was renamed as the European Community (EC) in 1993 by the Treaty of Maastricht. The ECSC expired in 2002 and the EC ceased to exist in 2009 as its absorption into the European Union was completed by the Treaty of Lisbon, which made the EU its own legal entity. For more history on the integration of the EU, see e.g. Dinan 2014.
[207] Article 13 TEU.
[208] Article 15 TEU
[209] Article 14 and 16 TEU.
[210] Article 103 TFEU.

The Commission is the executive branch of the EU. It promotes the general interest of the Union, ensures the application of the Treaties, and of measures adopted by the institutions pursuant to them.[211] The Commission oversees the application of Union law under the control of the Court of Justice of the European Union, makes proposals for legislative acts and executes the budget and manages programmes. The Commission also has other coordinating, executive and management functions, as laid down in the Treaties. The Commission ensures the application of the principles of the competition provisions of the Treaties and investigates cases of suspected infringement of these principles, in cooperation with the competent authorities in the Member States.[212] Directorate-General of Competition (DG COMP) is the Commission department responsible for the EU competition policy and enforcement of the Union competition rules.

The Court of Justice of the European Union is the judicial branch of the Union. It ensures that in the interpretation and application of the Treaties the law is observed.[213] It includes the Court of Justice, the General Court (formerly the Court of First Instance) and specialised courts. The CJEU rules on actions brought by a Member State, an institution or a natural or legal person, gives preliminary rulings, at the request of courts or tribunals of the Member States, on the interpretation of Union law or the validity of acts adopted by the institutions, and rules in other cases provided for in the Treaties. In competition matters, the General Court has the jurisdiction to hear and determine at first instance the legality of regulations and decisions of the Commission.[214] Decisions given by the General Court may be subject to a right of appeal to the Court of Justice on points of law only.[215]

The European Central Bank issues the euro and, together with the national central banks of the Member States whose currency is the euro, conducts the monetary policy of the Union.[216] The primary objective of the European Central Bank and the national central banks, constituting the European System of Central Banks, is to maintain price stability. The Court of Auditors carries out the Union's audit.[217]

[211] Article 17 TEU.
[212] Article 105 TFEU.
[213] Article 19 TEU.
[214] Article 256(1) TFEU and Article 263(1) TFEU.
[215] Article 256(1) TFEU.
[216] Article 282 TFEU.
[217] Article 285 TFEU.

The Treaties determine the distribution of competences between the Union and the Member States. The limits of Union competences are governed by the principle of conferral.[218] Under the principle of conferral, the Union shall act only within the limits of the competences conferred upon it by the Member States in the treaties to attain their objectives. Competences not conferred upon the Union in the Treaties remain with the Member States.[219]

The use of Union competences is governed by the principles of subsidiarity and proportionality.[220] The principle of subsidiarity determines when it is appropriate for the EU to act instead of the Member States when the EU does not have exclusive competence. The principle of proportionality, in turn, determines the extent of the Union action. Under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, either at central level or at regional and local level, but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level.[221] Under the principle of proportionality, the content and form of Union action shall not exceed what is necessary to achieve the objectives of the Treaties.[222]

The EU may have exclusionary competence, shared competence or supporting competence. The difference between the exclusionary and shared competence is that when the treaties confer on the Union exclusive competence in a specific area, only the Union may legislate and adopt legally binding acts, the Member States being able to do so themselves only if so empowered by the Union or for the implementation of Union acts.[223] By contrast, when the Treaties confer on the Union a competence shared with the Member States in a specific area, the Union and the Member States may legislate and adopt legally binding acts in that area. The Member States shall exercise their competence to the extent that the Union has not exercised its competence. The Member States shall again exercise their competence to the extent that the Union has decided to cease exercising its competence.[224] EU competition law belongs to the area of exclusive and shared competence. The Union has exclusive competence in the establishing of

[218] Article 5(1) TEU.
[219] Article 5(2) TEU.
[220] Article 5(1) TEU.
[221] Article 5(3) TEU.
[222] Article 5(4) TEU.
[223] Article 2(1) TFEU.
[224] Article 2(2) TFEU.

the competition rules necessary for the functioning of the internal market.[225] The internal market in general is among the areas where the EU has shared competence.[226]

In areas of supporting competence and under the conditions laid down in the treaties, the Union shall have competence to carry out actions to support, coordinate or supplement the actions of the Member States, without thereby superseding their competence in these areas.[227] The EU has also some special competences in the area of the common foreign and security policy[228] and coordination of economic, social and employment policies of the Member States[229].

There are general principles in the EU law which are not included in the Treaties but rather created in application of those Treaties by the CJEU, which has occasionally taken a very prominent role in the development of the Union law. One such fundamental principle is the 'direct effect' of the EU law, which was established by the Court of Justice in *Van Gend en Loos* in 1963.[230] In accordance with that principle, the Union law does not oblige only Member States but may produce direct effects and confer individual rights which national courts must protect. This principle is in stark contrast to the principles of international law, under which obligations are primarily applicable only to the states, and thus signifies the special status of the Union law in comparison with the international law. The direct effect of a Union provision depends on the type of the Union act and is subject to several conditions, including that the provision in question is clear, unconditional and not a positive but a negative obligation.[231] In addition to principle of direct effect, the Court of Justice has also established the principle of indirect effect, under which the national courts are required to interpret national laws, as far as possible, in the light of the wording and purpose of the provisions of the EU law.[232]

Another fundamental general principle is the 'primacy' (or 'supremacy') of the EU law, which provides that, if a national law contradicts the Union Law, the Union law takes precedence. This cornerstone principle of the EU law was established by the Court of Justice in 1964 in

[225] Article 3(1)(b) TFEU.
[226] Article 4(2)(a) TFEU.
[227] Article 2(5) TFEU.
[228] Article 2(4) TFEU.
[229] Article 5 TFEU.
[230] Case 26/62 *N.V. Algemene Transport- en Expeditie Onderneming van Gend en Loos v Nederlandse administratie der belastingen*, EU:C:1963:1.
[231] Ibid.
[232] Case C-106/89 *Marleasing SA v La Comercial Internacional de Alimentacion SA*, EU:C:1990:395.

Costa v ENEL.[233] The Court of Justice based the principle on the "special and original nature" of the Community treaty without a direct reference to its provisions:

> "It follows [...] that the law stemming from the Treaty, an independent source of law, could not, because of its special and original nature, be overridden by domestic legal provisions, however framed, without being deprived of its character as Community law and without the legal basis of the Community itself being called into question."[234]

The principle of primacy, as the principle of direct effect, is not included in the Treaties. However, the Treaty of Lisbon did attach a declaration to the Treaties acknowledging the existence of the principle of primacy.[235] The following case law of the CJEU has further established that a national court has a duty to give full effect to the provisions of the Union law and, if necessary, to refuse to apply any conflicting national laws, even if adopted subsequently.[236]

The courts of the Member States, which the EU relies on for the enforcement of its law, have accepted these principles in their practice in accordance with the principle of sincere cooperation, pursuant to which the Member States shall take any appropriate measure, general or particular, to ensure fulfilment of the obligations arising out of the Treaties or resulting from the acts of the institutions of the Union.[237]

3.2. *Overview of EU competition law and Article 101 TFEU*

The Treaties include the Union policies and their goals. Among these are the policies concerning the internal market and competition. The overarching purpose of the single market is contained in Article 3(3) TEU, which provides that the Union shall establish an internal market and work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full

[233] Case 6/64 *Flaminio Costa v. ENEL*, EU:C:1964:66.
[234] Ibid.
[235] Declarations annexed to the Final Act of the Intergovernmental Conference which adopted the Treaty of Lisbon, signed on 13 December 2007, 17. Declaration concerning primacy, published in OJ 2016/C 202/01. The principle of primacy was included in the Article I-6 of the Treaty establishing a Constitution for Europe (the Constitutional Treaty, published in OJ 2004/C 310/1), which was, however, not ratified due to its rejection by voters in referendums in France and in the Netherlands in 2005.
[236] Case 106/77 *Amministrazione delle Finanze dello Stato v. Simmenthal SpA*, EU:C:1978:49.
[237] Article 4(3) TEU.

employment and social progress, and a high level of protection and improvement of the quality of the environment. It shall also promote scientific and technological advance.

The role of the competition policy as an instrument of the internal market is verified in Protocol 27, annexed to the Treaties, under which the internal market as set out in Article 3 TEU includes a system ensuring that competition is not distorted and the Union shall, if necessary, take action under the provisions of the Treaties to this end. The Protocol has the same legal force as the provisions of the Treaties in accordance with the Article 51 TEU.[238] Together, Article 3(3) TEU and Protocol 27 have had significant effect in application of the competition law by the European Commission and the CJEU.[239] This "single market imperative" is a unique feature of the EU competition law as has been remarked by Whish and Bailey:

> "EU competition law has been (and will continue to be) strongly influenced by single market integration; this has meant that decisions have sometimes been taken prohibiting behaviour which a competition authority elsewhere, unconcerned with single market considerations, would not have reached. Faced with a conflict between the narrow interests of a particular firm and the wider aim of integrating national markets, the tendency has been to subordinate the former to the latter."[240]

The principle of an open market economy with free competition is also the foundation for economic policies of the Union and Member States. It is mentioned in Article 119(1) TFEU which provides that for the purposes set out in Article 3 TEU, the activities of the Member States and the Union shall include the adoption of an economic policy which is based on the close coordination of Member States' economic policies, on the internal market and on the definition of common objectives, and conducted in accordance with the principle of an open market economy with free competition.

The most important provisions of the Treaties concerning the Union competition law are contained in Chapter 1 of Title VII of Part Three of the TFEU. The main provisions are Article 101 TFEU concerning restrictive agreements, Article 102 TFEU concerning abuse of dominant position, Article 106 TFEU concerning public undertakings and special and exclusive rights and Articles 107-109 TFEU concerning the prohibited state aid. In addition to these provisions, important legislative acts in the EU competition law include the EU Merger Regulation

[238] Article 51 TEU: "The Protocols and Annexes to the Treaties shall form an integral part thereof."
[239] Whish and Bailey 2018, p. 52.
[240] Ibid, p. 24.

139/2004[241] (the 'EUMR') concerning merger control and Regulation 1/2003[242], which provides the Commission and national competition authorities (the 'NCAs') and national courts powers to enforce Articles 101 and 102 TFEU. The following discussion will focus on Article 101 in more detail.

Article 101(1) prohibits agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the internal market. Particularly prohibited are agreements, decisions and concerted practices which: (a) directly or indirectly fix purchase or selling prices or any other trading conditions; (b) limit or control production, markets, technical development, or investment; (c) share markets or sources of supply; (d) apply dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage; (e) make the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts. Under Article 102(2), any such agreements or decisions prohibited shall be automatically void.

The 'effect on trade between the Member states' is an important concept in many regards. It is a prerequisite for the applicability of the Articles 101 and 102 TFEU and it also determines the jurisdiction of the NCAs and national courts in the enforcement of those rules.[243] The CJEU has clarified the concept numerous times in its case law which the Commission has cited in its *Guidelines on the effect on trade concept contained in Articles [101 and 102 TFEU]* (the '*Guidelines on inter-state trade'*)[244]. Firstly, for the application of Article 101, it is enough that the agreement or practice as a whole is capable of affecting trade.[245] It is not required that each individual clause in an agreement should be capable of affecting inter-state trade.[246] Similarly,

[241] Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation), published in OJ 2004/L 24/1.
[242] Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty, published in OJ 2003/L 1/1.
[243] Under Article 3(1) of Regulation 1/2003, where the competition authorities of the Member States or national courts apply national competition law to agreements, decisions by associations of undertakings or concerted practices which may affect trade between Member States, they shall also apply Article 101 TFEU to such agreements, decisions or concerted practices. Similarly, where the competition authorities of the Member States or national courts apply national competition law to any abuse prohibited by Article 102 TFEU, they shall also apply Article 102 TFEU.
[244] Commission Notice — Guidelines on the effect on trade concept contained in Articles 81 and 82 of the Treaty, published in OJ 2004/C 101/07.
[245] Ibid, para 14.
[246] Case 193/83 *Windsurfing*, EU:C:1986:75, para 96.

in the application of Article 102 and the case of abuse of a dominant position, the behaviour of the dominant undertaking must be assessed in terms of its overall impact.[247] Secondly, the concept of "trade" is not limited to traditional exchanges of goods and services across borders but is a wider concept, covering all cross-border economic activity including establishment.[248] The concept covers also cases where agreements or practices affect the competitive structure of the market.[249]

Thirdly, the notion 'may affect' reflects the fact that the effect on trade criterion is a jurisdictional one, serving to distinguish those agreements and practices which warrant an examination under the Union competition rules and those which do not.[250] It is not required to establish that agreements have in fact appreciably affected trade but merely that such agreements are capable of having that effect.[251] It must be, however, possible to foresee with a sufficient degree of probability on the basis of a set of objective factors of law or of fact that the agreement may have an influence, direct or indirect, actual or potential, on the pattern of trade between Member States.[252] Merely hypothetical or speculative effects are not sufficient for establishing Union law jurisdiction.[253] Fourthly, the effect on trade must be 'appreciable', that is, of a certain magnitude.[254] Appreciability may be appraised in particular by reference to the position and the importance of the parties on the market for the products concerned.[255] Consequently, an agreement falls outside the prohibition in Article 101 when it has only an insignificant effect on the markets, taking into account the weak position which the persons concerned have on the market of the product in question.[256] It should be noted that the concept of appreciable effect on inter-state trade is distinct from appreciable restriction of competition which is another prerequisite for the application of Article 101.

There is an important difference between the agreements, decisions and concerted practices which have as their *object* the prevention, restriction or distortion of competition and the

[247] *Guidelines on inter-state trade*, para 17.
[248] Ibid, para 19. See also the referred case law Case 172/80 *Züchner*, EU:C:1981:178, para 18; Case C-309/99 *Wouters*, EU:C:2002:98, para 95; Case C-475/99 *Ambulanz Glöckner*, EU:C:2001:577, para 49; Joined cases C-215/96 and C-216/96 *Bagnasco*, EU:C:1999:12, para 51; Case C-55/96 *Job Centre*, EU:C:1997:603, para 37; and Case C-41/90 *Höfner and Elser*, EU:C:1991:161, para 33.
[249] *Guidelines on inter-state trade*, para 20. See also Joined cases 6 and 7-73 *Commercial Solvents v Commission*, EU:C:1974:18, para 33.
[250] *Guidelines on inter-state trade*, para 35.
[251] Case 19/77 *Miller*, EU:C:1978:19, para 15, and Case T-228/97 *Irish Sugar*, EU:T:1999:246, para 170.
[252] Case 5-69 *Völk v Vervaecke*, EU:C:1969:35, para 5.
[253] *Guidelines on inter-state trade*, para 43.
[254] Case 22-71 *Béguelin*, EU:C:1971:113, para 16.
[255] Case C-306/96 *Javico*, EU:C:1998:173, para 17.
[256] Case 5-69 *Völk v Vervaecke*, EU:C:1969:35, para 7.

agreements, decisions and concerted practices which have as their *effect* of doing so. The reason for this distinction, as the Court of Justice has interpret it in *Cartes Bancaires*[257], is that certain types of coordination between undertakings can be regarded, by their very nature, as being harmful to the proper functioning of normal competition.[258] Consequently, it is established that certain collusive behaviour may be considered so likely to have negative effects that it may be considered redundant, for the purposes of applying Article 101(1) TFEU, to prove that they have actual effects on the market.[259] The essential legal criterion for ascertaining whether coordination between undertakings involves such a restriction of competition 'by object' is the finding that such coordination reveals in itself a sufficient degree of harm to competition.[260]

In the absence of a restriction of competition 'by object', agreements, decisions and concerted practices may be prohibited under Article 101(1) if they restrict competition 'by effect'. In accordance with the settled case law of the CJEU, in order to determine whether an agreement is to be considered to be prohibited by reason of the distortion of competition which is its effect, the competition in question should be assessed within the actual context in which it would occur in the absence of the agreement in dispute.[261] Such an assessment is not restricted to actual effects alone but it must also take account of the agreement's potential effects on competition within the internal market.[262] This means that a full analysis of the agreement in its market context must be conducted before it is possible to assess whether the effect of the agreement is to restrict competition.[263]

The object-effect distinction of Article 101(1) loosely resembles the '*per se*' and 'rule of reason' distinction in the US antitrust law, although the US and EU antitrust laws are materially different from each other. Under the Sherman Act in the US, some agreements, such as horizontal price-fixing agreements, are considered illegal *per se*, by itself, whereas in other cases conduct's anticompetitiveness must be judged under the rule of reason standard, first established by the US Supreme Court in *Standard Oil Co. v United States*[264] in 1911. In the rule of reason doctrine, the pro- and anticompetitive effects of a disputed conduct are weighed to

[257] Case C-67/13 P *Groupement des cartes bancaires v Commission*, EU:C:2014:2204.
[258] Ibid, para 50.
[259] Ibid, para 51.
[260] Ibid, para 57.
[261] Case C-7/95 P *John Deere v Commission*, EU:C:1998:256, para 76. See also the referred case law Case 56/65 *Société Technique Minière*, EU:C:1966:38, and Case 31/80 *L'Oréal v De Nieuwe AMCK*, EU:C:1980:289, para 19.
[262] Ibid, para 77.
[263] Whish and Bailey 2018, p. 134.
[264] *Standard Oil Co. of New Jersey v. United States*, 221 U.S. 1 (1911).

assess whether the conduct unreasonably restricts trade and thus should be prohibited. This is done by using a three-step, burden-shifting framework. The plaintiff must first prove that the challenged conduct has a substantial anticompetitive effect that harms consumers in the relevant market. If the plaintiff shows this, then the burden shifts to the defendant to show procompetitive effects of the conduct. If the defendant demonstrates this, then the burden shifts back to the plaintiff to show that the procompetitive efficiencies could be reasonably achieved through less anticompetitive means.[265] However, the rule of reason doctrine does not exist in the EU law, as the CJEU has stated in its case law[266], largely because the EU competition law includes in its place Article 101(3) TFEU, for which there is no equivalent provision in the US antitrust law.[267] The Commission has noted that:

> "If more systematic use were made under Article [101(1)] of an analysis of the pro- and anti-competitive aspects of a restrictive agreement, Article [101(3)] would be cast aside, whereas any such change could be made only through revision of the Treaty. It would at the very least be paradoxical to cast aside Article [101(3)] when that provision in fact contains all the elements of a 'rule of reason'."[268]

Article 101(3) establishes a legal exception to the prohibition of Article 101(1). It provides that Article 101(1) may be declared inapplicable in the case of any agreement between undertakings, decision by associations of undertakings or concerted practice, or categories of these, which contributes to improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefit, and which does not: (a) impose on the undertakings concerned restrictions which are not indispensable to the attainment of these objectives; (b) afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products in question. These conditions are cumulative and all four of them must be satisfied for an agreement to be exempted under Article 101(3).[269]

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[265] *Ohio v. American Express Co.*, 585 U.S. ____, 9-10 (2018).
[266] See e.g. Case C-235/92 P *Montecatini v Commission*, EU:C:1999:362, para 133; Case T-112/99 *Métropole télévision (M6) v Commission*, EU:T:2001:215, paras 72 and 74; Case T-65/98 *Van den Bergh Foods v Commission*, EU:T:2003:281, paras 106-107; and Case T-328/03 *O2 (Germany) v Commission*, EU:T:2006:116, para 69.
[267] Case T-112/99 *Métropole télévision (M6) v Commission*, EU:T:2001:215, para 74: "Article [101(3) TFEU] would lose much of its effectiveness if such an examination had to be carried out already under Article [101(1) TFEU]."
[268] White paper on modernisation of the rules implementing Articles 85 and 86 of the EC Treaty, published in OJ 1999/C 132/1, para 57.
[269] See Joined Cases 43/82 and 63/82 *VBVB and VBBB v Commission*, EU:C:1984:9, para 61; Case 42/84 *Remia and others v Commission*, EU:C:1985:327, para 38; and Case C-68/12 *Slovenská sporiteľňa*, EU:C:2013:71, para 36.

Before 2004, under Article 9(1) of the Regulation 17 of 1962[270], the Commission, subject to review of its decision by the Court of Justice, had sole power to declare Article 101(1) TFEU inapplicable. This resulted in a burdensome notification system which prevented the Commission from concentrating its resources on curbing the most serious infringements and imposed considerable costs on undertakings.[271] Following the Regulation 1/2003, which modernised the public enforcement of the EU competition rules, the Commission no longer has a monopoly over defining which agreements, decisions and concerted practices qualify for the exception of Article 101(3) and authority to grant these individual exemptions. Undertakings themselves are now responsible to ensure that their agreements, decisions and concerted practices comply with the EU competition rules. The undertaking or association of undertakings claiming the benefit of Article 101(3) bears the burden of proving that the conditions of that provision are fulfilled.[272]

It is noteworthy that *any* agreement can be exempted under Article 101(3), including, in principle, agreements which restrict competition 'by object'.[273] This is another difference with the US antitrust law where the unlawfulness of agreements, which are found to be illegal *per se,* cannot be rebutted thereafter based on their procompetitive effects. However, the Commission has been very reluctant to apply Article 101(3) in individual cases after the adoption of Regulation 1/2003 and abolition of the old notification system. This has contributed to a widely held belief that it is difficult for an agreement to satisfy the four conditions of Article 101(3), and perhaps impossible in the case of an object restriction.[274]

Instead of satisfying the conditions of Article 101(3) individually, a restrictive agreement may also be considered lawful under Article 101(3) if it qualifies for a block exemption issued for a category of agreements, decisions or concerted practices by the Council or the Commission, acting under the authority conferred to it by the Council in accordance with the Article 103(2)(b) TFEU. The Commission's *Guidelines on the application of Article [101(3) TFEU]*

[270] EEC Council: Regulation No 17: First Regulation implementing Articles 85 and 86 of the Treaty, published in OJ 1962 13/204.
[271] Recital 3 of Regulation 1/2003.
[272] Article 2 of Regulation 1/2003.
[273] See Case T-460/13 *Ranbaxy (UK) v Commission*, EU:T:2016:453, para 228; Case C-439/09 *Pierre Fabre Dermo-Cosmétique*, EU:C:2011:649, para 59; and Case T-17/93 *Matra Hachette v Commission*, EU:T:1994:89, para 85.
[274] Whish and Bailey 2018, p. 176.

(the '*Article 101(3) Guidelines')*[275] provides that when an agreement is covered by a block exemption the parties to the restrictive agreement are relieved of their burden under Article 2 of Regulation 1/2003 of showing that their individual agreement satisfies each of the conditions of Article 101(3). The parties only have to show that the restrictive agreement benefits from a block exemption. The application of Article 101(3) to categories of agreements by way of block exemption regulation is based on the presumption that restrictive agreements that fall within their scope fulfil each of the four conditions laid down in Article 101(3).[276] This means that if an agreement is within the block exemption it is then in practice redundant to assess whether it infringes Article 101(1).[277]

The Commission has granted many categories of agreements a 'safe harbour' in form of a block exemption, each of which has an expiry date. Important block exemptions include, among others, Regulation 330/2010[278] on vertical agreements and Regulation 316/2014[279] on technology transfer agreements, issued under the Council Regulation 19/65[280], as amended by Regulation 1215/1999[281], and Regulation 1217/2010[282] on research and development agreements and Regulation 1218/2010[283] on specialisation agreements, issued under the Council Regulation 2821/71[284].

A restrictive agreement may also be exempted from Article 101(1) under the *de minimis* doctrine developed by the Court of Justice in *Völk v Vervaecke*[285]. Under this doctrine,

[275] Communication from the Commission — Notice — Guidelines on the application of Article 81(3) of the Treaty, published in OJ 2004/C 101/08.
[276] Ibid, para 35.
[277] Case C-260/07 *Pedro IV Servicios SL v Total España SA*, EU:C:2009:215, para 36.
[278] Commission Regulation (EU) No 330/2010 of 20 April 2010 on the application of Article 101(3) of the Treaty on the Functioning of the European Union to categories of vertical agreements and concerted practices, published in OJ 2010/L 102/1.
[279] Commission Regulation (EU) No 316/2014 of 21 March 2014 on the application of Article 101(3) of the Treaty on the Functioning of the European Union to categories of technology transfer agreements, published in OJ 2014/L 93/17.
[280] Regulation No 19/65/EEC of 2 March of the Council on application of Article 85(3) of the Treaty to certain categories of agreements and concerted practices, published in OJ 1965 36/533.
[281] Council Regulation (EC) No 1215/1999 of 10 June 1999 amending Regulation No 19/65/EEC on the application of Article 81(3) of the Treaty to certain categories of agreements and concerted practices, published in OJ 1999/L 148/1.
[282] Commission Regulation (EU) No 1217/2010 of 14 December 2010 on the application of Article 101(3) of the Treaty on the Functioning of the European Union to certain categories of research and development agreements, published in OJ 2010/L 335/36.
[283] Commission Regulation (EU) No 1218/2010 of 14 December 2010 on the application of Article 101(3) of the Treaty on the Functioning of the European Union to certain categories of specialisation agreements, published in OJ 2010/L 335/43.
[284] Regulation (EEC) No 2821/71 of the Council of 20 December 1971 on application of Article 85(3) of the Treaty to categories of agreements, decisions and concerted practices, published in OJ 1971/L 285/46.
[285] Case 5-69 *Völk v Vervaecke*, EU:C:1969:35.

agreements which have only an insignificant effect on the market do not constitute an appreciable restriction of competition and thus fall outside of scope of Article 101(1).[286] The Court of Justice has refined the doctrine in *Expedia*[287] by excluding from its scope agreements that are restrictive 'by object'. Such agreements constitute, by their nature and independently of any concrete effect that they may have, an appreciable restriction on competition.[288] The Commission *Notice on Agreements of Minor Importance*[289] provides guidance on appreciability and a safe harbour from application of Article 101(1) for agreements which do not exceed certain market thresholds. These thresholds are 10 percent aggregate market share held by the parties (for agreements between competitors) and 15 percent market share held by each of the parties (for agreements between non-competitors) on any of the relevant markets.[290]

As for market definition, it may be necessary to define the relevant market under Article 101 TFEU when examining whether an agreement or practice has an appreciable effect on trade[291] or an appreciable effect on restricting competition[292] and under different block exemptions when these contain market thresholds. Market definition plays an important role in the application of other EU competition rules as well. It is the first step in the assessment of dominance under Article 102 in which the definition of the relevant market is "of essential significance" for the appraisal of dominant position.[293] Likewise, a proper definition of the relevant market is a necessary precondition for the assessment of the effects of the concentration on competition in merger cases under EUMR.[294] The definition of the relevant market serves a different purpose according to whether Article 101 or Article 102 is to be applied, however.[295] This follows from the fact that, for the purposes of Article 102, establishing the existence of a dominant position in a given market presupposes that such a market has already been defined, whereas, for the purposes of applying Article 101, the reason for defining the relevant market

[286] It should be remembered from the foregoing discussion that for the application of the Union law it is necessary that there exists both an appreciable restriction on competition and an appreciable effect on trade between the Member States.
[287] Case C-226/11 *Expedia*, EU:C:2012:795.
[288] Ibid, para 37.
[289] Communication from the Commission — Notice on agreements of minor importance which do not appreciably restrict competition under Article 101(1) of the Treaty on the Functioning of the European Union (De Minimis Notice), published in OJ 2014/C 291/01.
[290] Ibid, para 8.
[291] *Guidelines on inter-state trade*, para 55.
[292] Case C-234/89 *Delimitis v Henninger Bräu*, EU:C:1991:91, para 16.
[293] Case 6-72 *Continental Can v Commission*, EU:C:1973:22, para 32.
[294] Joined cases C-68/94 and C-30/95 *France and Others v Commission (Kali & Salz)*, EU:C:1998:148, para 143; Case T-342/99 *Airtours v Commission*, EU:T:2002:146, para 19; and Case T-151/05 *NVV v Commission*, EU:T:2009:144, para 51.
[295] See Joined cases C-125/07 P, C-133/07 P, C-135/07 P and C-137/07 P *Erste Group Bank AG v Commission*, EU:C:2009:576, paras 60-63, and Joined cases T-259/02 to T-264/02 and T-271/02 *Raiffeisen Zentralbank Österreich and Others v Commission*, EU:T:2006:396, paras 172-178.

is to determine whether the agreement or practice at issue is liable to affect trade between Member States and has as its object or effect restriction of competition.[296] As a general rule, there is an obligation on the Commission to define the relevant market in applying Article 101 where it is impossible, without such a definition, to determine whether the agreement or practice is liable to affect trade between Member States and has as its object or effect restriction of competition.[297]

The Commission has published *Notice on Market Definition* which provides guidance on its market definition practice and which has been cited by the CJEU many times in its case law.[298] Although the Commission cannot depart from rules which it has imposed on itself[299], the Commission retains, where the terms of its notices allow so, great freedom of action to choose those types of evidence or approaches which are the most appropriate in the circumstances of a given case[300]. The CJEU has recognised that the Commission has a 'margin of assessment' in economic or technical matters that are complex, such as market definition, which allows the Commission flexibility in its administrative practice. The CJEU, however, must establish whether the evidence put forward is factually accurate and capable of substantiating the conclusions drawn from it.[301]

Notice on Market Definition determines that the relevant market is established by the combination of the product and geographic markets.[302] A relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use.[303] The relevant geographic market, in turn, comprises the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those area.[304]

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[296] Case T-29/92 *SPO and Others v Commission*, EU:T:1995:34, para 74.
[297] Case T-62/98 *Volkswagen v Commission*, EU:T:2000:180, para 230. See also the referred case law Joined cases T-374/94, T-375/94, T-384/94 and T-388/94 *European Night Services and Others v Commission*, EU:T:1998:198, paras 93-95 and 105.
[298] Case T-321/05 *AstraZeneca AB v Commission*, EU:T:2010:266, paras 86-87, and Case T-427/08 *Confédération européenne des associations d'horlogers-réparateurs (CEAHR) v Commission*, EU:T:2010:517, paras 68-70.
[299] Case T-7/89 *SA Hercules Chemicals NV v Commission*, EU:T:1991:75, para 53.
[300] Case T-210/01 *General Electric v Commission*, EU:T:2005:456, para 519.
[301] Case T-321/05 *AstraZeneca AB v Commission*, EU:T:2010:266, paras 32-33, and Case T-201/04 *Microsoft Corp. v Commission*, EU:T:2007:289, paras 87-89.
[302] *Notice on Market Definition*, para 9.
[303] Ibid, para 7.
[304] Ibid, para 8.

Pursuant to *Notice on Market Definition*, the main purpose of market definition is to identify in a systematic way the competitive constraints that the undertakings involved face.[305] Those constraints may be derived from three main sources: demand substitutability, supply substitutability and potential competition.[306] The assessment of demand substitution entails a determination of the range of products which are viewed as substitutes by the consumer.[307] The hypothetical monopolist test (SSNIP test) is employed to achieve this. Specifically, the question to be answered is whether the customers would switch to readily available substitutes or to suppliers located elsewhere in response to a hypothetical small (in the range 5 to 10 percent) but permanent relative price increase in the products and areas being considered. If substitution were enough to make the price increase unprofitable because of the resulting loss of sales, additional substitutes and areas are included in the relevant market.[308]

Supply-side substitutability may also be taken into account when suppliers, in response to small and permanent changes in relative prices, are able to switch production to the relevant products and market them in the short term without incurring significant additional costs or risks. This additional production that is put on the market will have a disciplinary effect on the competitive behaviour of the companies involved.[309] In other cases and more typically, however, supply substitutability is considered only at the later stage of competition analysis when assessing market power of the companies involved. The same applies for potential competition which is not taken into account when defining markets but at a subsequent stage, in general once the position of the companies involved in the relevant market has already been ascertained.[310]

Next, in the fourth chapter, I will discuss the CJEU case law and Commission decision-making practice concerning payment systems as two-sided platforms and the implications of the Court of Justice's judgments for the EU competition law.

[305] Ibid, para 2.
[306] Ibid, para 13.
[307] Ibid, para 17.
[308] Ibid, para 17.
[309] Ibid, para 20.
[310] Ibid, para 24.

4. Multi-sided platforms in the EU case law: payment card systems

While cases involving multi-sided platforms that have dealt specifically with two-sided markets have been few in the CJEU case law, the Commission has had a chance to address two-sided markets in several cases that have involved mainly payment systems and digital platforms[311]. For instance, in *Facebook/WhatsApp*[312] merger case the Commission approved the acquisition of WhatsApp by Facebook on grounds that the parties were not close competitors in the market of consumer communications apps, which was a very dynamic and fast-growing market characterised by frequent market entry and short innovation cycles.[313] This conclusion was based, *inter alia*, on the Commission's finding that WhatsApp and Facebook Messenger were used simultaneously by the majority of users in the EEA and that this multi-homing made them complementary.[314] The Commission also determined that despite network effects barriers to entry in the market were low, which made any market position unlikely to be incontestable.[315] In *Google Android*[316] antitrust case the Commission in turn fined Google a record of 4.34 billion euros for imposing illegal restrictions on Android device manufacturers and mobile network operators. Following a market definition exercise in two-sided markets which involved the use of a SSNDQ test, the Commission found that Google had abused its dominant position within the meaning of Article 102 TFEU in the national markets of general internet search services and in the worldwide markets (excluding China) of licensable smart mobile operating systems and Android app stores.

Although the Commission has not yet clarified its administrative practice on market definition or competitive assessment of multi-sided platforms by way of guidelines or notices regarding, for instance, the question of when to follow the single-market approach or the multiple-market approach in market definition[317], the past cases have developed the Commission's approach to competitive assessment of platforms and provided the context in which the CJEU has addressed the implications of two-sided markets for the EU case law.

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311 See e.g. Case AT.39740 *Google Search (Shopping)*, Case AT.40099 *Google Android*, Case M.4731 *Google/DoubleClick*, Case M.5727 *Microsoft/Yahoo! Search Business*, Case M.6281 *Microsoft/Skype*, Case M.7217 *Facebook/WhatsApp*, Case M.8124 *Microsoft/LinkedIn* and Case M.8180 *Verizon/Yahoo*. For a very brief summary of these cases, see Franck and Peitz 2019, pp. 20-21.
312 Case M.7217 *Facebook/WhatsApp*.
313 Ibid, para 99.
314 Ibid, para 105.
315 Ibid, para 132.
316 Case AT.40099 *Google Android*, under appeal (Case T-604/18 *Google and Alphabet v Commission*, not yet decided).
317 See Franck and Peitz 2019, p. 30.

Thus far, the Court of Justice have dealt with two-sided markets and their implications for competitive analysis on two occasions that involved payment systems. On 11 September 2014, the Court of Justice gave judgments in landmark cases *Cartes Bancaires*[318] and *MasterCard*[319] which clarified the established case law on restrictions of competition under Article 101 TFEU and established new rules applicable to two-sided markets. Unlike the General Court, which reviewed the Commission's market definition practice in these cases, the Court of Justice did not discuss market definition directly in either case. However, the Court of Justice recognised the two-sided nature of the payment systems and emphasised that effects of restrictions beyond the relevant market cannot be ignored in the analysis of restrictions of competition concerning two-sided platforms. These cases and their implications for the EU competition law will be discussed in detail below.

Cartes Bancaires concerned the Groupement des Cartes Bancaires (CB), a group of main French banking institutions, which manages a system for bank card payments and withdrawals between its members in France, In cooperation with Visa and MasterCard, the CB system enables payments from cardholders to merchants affiliated with the CB group and withdrawals from automatic teller machines (ATMs) operated by CB members (acquiring side) using bank cards issued by CB members (issuing side). In the early 2000s, CB planned to adopt new pricing measures, which included fees for issuing cards and joining the group, and notified these to the Commission under Regulation 17 of 1962. According to CB, the fees were aimed to encourage its members to expand their acquiring activities and to prevent free-riding on investments made by those members whose acquiring activities were considerable in relation to their issuing activities.[320]

After investigating the measures, the Commission adopted a series of statement of objections and a subsequent decision[321] in which it found that the scheme had the object and effect of restricting competition by hindering competition from new entrants and limiting the issuing of cards and that it therefore infringed Article 101 TFEU. The Commission recognised that, as in other card payment systems, four parties were involved in the processing of payment transactions in the CB system: card-issuing financial institutions ('issuers'), merchant-acquiring (or ATM-managing) financial institutions ('acquirers'), cardholders and merchants equipped with payment terminals. It made a distinction between payment card issuance,

[318] Case C-67/13 P *Groupement des cartes bancaires v Commission*, EU:C:2014:2204.
[319] Case C-382/12 P *MasterCard v Commission*, EU:C:2014:2201.
[320] Case C-67/13 P *Groupement des cartes bancaires v Commission*, EU:C:2014:2204, paras 3-4.
[321] Case COMP/D1/38.606 *Groupement des cartes bancaires "CB"*.

acquiring of payment and withdrawal transactions, and competition between systems and examined each of these separately. Based on these considerations, the Commission defined the relevant market in the case to be the issuance of payments cards in France.[322] The Commission thus followed the approach it had adopted in its *Visa International - Multilateral Interchange Fee* decision in which it considered the card payment systems market ("system/network market") to be separate from issuance and acquiring markets ("intrasystem markets").[323] This approach to market definition of payment systems is a mixture of the single-market approach and the multiple-markets approach in a sense that a single market is defined for card payment transactions while separate markets are defined for card-related services offered to each side of a two-sided platform.

However, unlike in the *Visa International - Multilateral Interchange Fee* decision in which the Commission had recognised that the competition in the payment systems market is determined by inter-related decisions of consumers and merchants[324], in *Cartes Bancaires* the Commission deviated from its earlier practice and defined that payment systems competed with one another to induce financial institutions (not consumers and merchants) to join their network instead of joining another payment system network.[325] By focusing only on the adoption of the payment card system by banks with regard to payment system market, the Commission disregarded the importance of card usage by consumers and merchants for competition between these systems.[326]

CB appealed to the General Court, which dismissed the appeal in its entirety.[327] The General Court agreed with the Commission that the pricing measures restricted competition 'by object' and therefore there was no need to examine further the appellant's arguments on whether the pricing measures had the effect of restricting competition. On appeal, the Court of Justice however set aside the judgment of the General Court and referred the case back to it.[328] The Court of Justice concluded that the General Court had erred in law in holding that the pricing measures had as their object a restriction of competition and that it had failed to observe the standard of judicial review required under the case law.[329] Following a referral from the Court

[322] Ibid, paras 163-164 and 189.
[323] Case COMP/29.373 *Visa International - Multilateral Interchange Fee*, recital 43.
[324] Ibid, para 46.
[325] Case COMP/D1/38.606 *Groupement des cartes bancaires "CB"*, para 167.
[326] Filistrucchi et al. 2014, p. 312.
[327] Case T-491/07 *Groupement des cartes bancaires v Commission*, EU:T:2012:633. For an English summary, see Stone 2013.
[328] Case C-67/13 P *Groupement des cartes bancaires v Commission*, EU:C:2014:2204.
[329] Ibid, para 92.

of Justice, the General Court eventually upheld the Commission decision for a second time, finding that the pricing measures restricted competition 'by effect' within the meaning of Article 101 TFEU.[330]

In *Cartes Bancaires* the Court of Justice made important remarks on various points of the EU competition law. Firstly, the Court of Justice expressly acknowledged for the first time that concept of restriction of competition 'by object' must be interpreted restrictively.[331] It affirmed that the concept can be applied "only to certain types of coordination between undertakings which reveal a sufficient degree of harm to competition that it may be found that there is no need to examine their effects".[332] This clarified established case law and put an end to the steady expansion of the 'object box' in the Commission decision-making practice, especially following judgments in cases *T-Mobile*[333] and *Allianz Hungária*[334] where the Court of Justice had adopted a much broader view of object restrictions.[335]

Secondly, the Court of Justice made also an important remark on the standard of judicial review required from the General Court under the union case law. The Court of Justice remarked that although the Commission has a 'margin of assessment' with regard to economic matters, in particular in the context of complex economic assessments, that does not mean that the General Court must refrain from reviewing the Commission's "legal classification of information of an economic nature".[336] The Court of Justice further elaborated that the General Court must not substitute its own economic assessment for that of the Commission but it must establish whether the evidence relied on is factually accurate, reliable and consistent and whether that evidence contains all the relevant information which must be taken into account in order to assess a complex situation and whether it is capable of substantiating the conclusions drawn from it.[337] The Court of Justice noted that the General Court had failed to review whether the evidence used by the Commission enabled it correctly to conclude that the pricing measures displayed a sufficient degree of harm to competition to be regarded as having as their object a restriction of competition within the meaning of Article 101(1) TFEU.[338] These statements marked the first

[330] Case T-491/07 RENV *Groupement des cartes bancaires v Commission*, EU:T:2016:379. For an English summary, see Canapa 2016.
[331] Pradelles and Scordamaglia-Tousis 2014, p. 142.
[332] Case C-67/13 P *Groupement des cartes bancaires v Commission*, EU:C:2014:2204, para 58.
[333] Case C-8/08 *T-Mobile*, EU:C:2009:343.
[334] Case C-32/11 *Allianz Hungária Biztosító Zrt*, EU:C:2013:160.
[335] See Whish and Bailey 2018, pp. 123-125.
[336] Case C-67/13 P *Groupement des cartes bancaires v Commission*, EU:C:2014:2204, para 46.
[337] Ibid. See also Case C-386/10 P *Chalkor v Commission*, EU:C:2011:815, para 54.
[338] Ibid, para 90.

time that the Court of Justice distinguished so clearly the General Court's required level of the judicial review from the Commission's 'margin of assessment'.[339]

Thirdly, and most importantly with respect to two-sided markets, the Court of Justice concluded that two-sidedness of a system must be taken into account in the analysis of object restrictions, regardless of the specific definition of the relevant market. The General Court had held that, since the relevant market was the issue of payment cards in France, the balancing between the issuing and acquisition activities within the CB system did not have to be examined in the context of Article 101(1) TFEU.[340] The Court of Justice rejected this view, stating that the General Court had confused the definition of the relevant market and the context which must be taken into account in order to ascertain whether the content of an agreement or a decision by an association of undertakings reveals the existence of a restriction of competition 'by object' within the meaning of Article 101(1) TFEU.[341] The Court of Justice clarified the need for contextual analysis in cases that concern two-sided systems in a following manner:

> "In order to assess whether coordination between undertakings is by nature harmful to the proper functioning of normal competition, it is necessary […] to take into consideration all relevant aspects – having regard, in particular, to the nature of the services at issue, as well as the real conditions of the functioning and structure of the markets – of the economic or legal context in which that coordination takes place, *it being immaterial whether or not such an aspect relates to the relevant market*. […] That must be the case, in particular, when that aspect is the *taking into account of interactions between the relevant market and a different related market* […] and, all the more so, when, as in the present case, there are interactions between the two facets of a two-sided system."[342]

Cartes Bancaires, in the above paragraphs of the judgment, established the principle that the interaction between the two sides of a two-sided market must be taken into account in the assessment of object restrictions under Article 101 TFEU irrespective of how the relevant market is defined or whether a restriction concerns only one side of the market.[343] The Court of Justice decided to do this by reiterating settled case law regarding object restrictions on one-sided markets and extending contextual analysis from these to concern all sides of two-sided

[339] Pradelles and Scordamaglia-Tousis 2014, p. 149.
[340] Case T-491/07 *Groupement des cartes bancaires v Commission*, EU:T:2012:633, para 105.
[341] Case C-67/13 P *Groupement des cartes bancaires v Commission*, EU:C:2014:2204, paras 76-77.
[342] Ibid, paras 78-79. Emphasis added.
[343] Nazzini and Nikpay 2014, p. 167.

markets, venturing beyond the boundaries of the relevant market.[344] This solution neatly sidestepped the issue of market definition in two-sided markets which the Court of Justice did not discuss. Indeed, it seems that the Court of Justice deliberately refrained from confirming or rejecting the General Court's endorsement of the Commission's view of the relevant market for payment cards since it was not necessary to reach the decision it adopted.[345]

In *MasterCard*[346] the Court of Justice extended similar reasoning to assessment of restrictions of competition 'by effect' under Article 101 TFEU. The *MasterCard* case concerned 'multilateral interchange fees' (MIF) set by MasterCard Inc. and its subsidiaries for payments made by using MasterCard and Maestro cards within the European Economic Area (EEA). In 'open' four-party payment systems[347], as those of Visa and MasterCard traditionally have been, there is often an interchange fee that typically a cardholder's bank (the 'issuing bank') charges to a merchant's bank (the 'acquiring bank') upon each transaction between a cardholder and a merchant that is made by using a system's payment card.[348] The interchange fees should not be confused with fees that the acquiring bank charges to merchants for its services or fees that the issuing bank may charge to cardholders from holding and using the card. The MIF is a fallback or default interchange fee, set by the payment card association that operates the payment system in the absence of a bilateral agreement between the issuing and the acquiring bank on interchange fees.[349] Figure 1 demonstrates the operation of a four-party payment card scheme.

[344] Pradelles and Scordamaglia-Tousis 2014, p. 142. See also Case C-32/11 *Allianz Hungária Biztosító Zrt*, EU:C:2013:160, para 36, and the case law cited therein.
[345] Franck and Peitz 2019, p. 30.
[346] Case C-382/12 P *MasterCard v Commission*, EU:C:2014:2201.
[347] In an 'open' payment system, such as those of Visa and MasterCard, the members of the payment card association issue cards, acquire merchants and set prices independently whereas in a 'closed' payment system, such as those of American Express, Diners Club and Discover, the payment card company that operates the payment system issues cards, acquires merchants and set prices directly. See Klein et al. 2006, p. 572.
[348] Filistrucchi et al. 2014, p. 304.
[349] Case COMP/34.579 *MasterCard*, Case COMP/36.518 *EuroCommerce*, Case COMP/38.580 *Commercial Cards*, para 1.

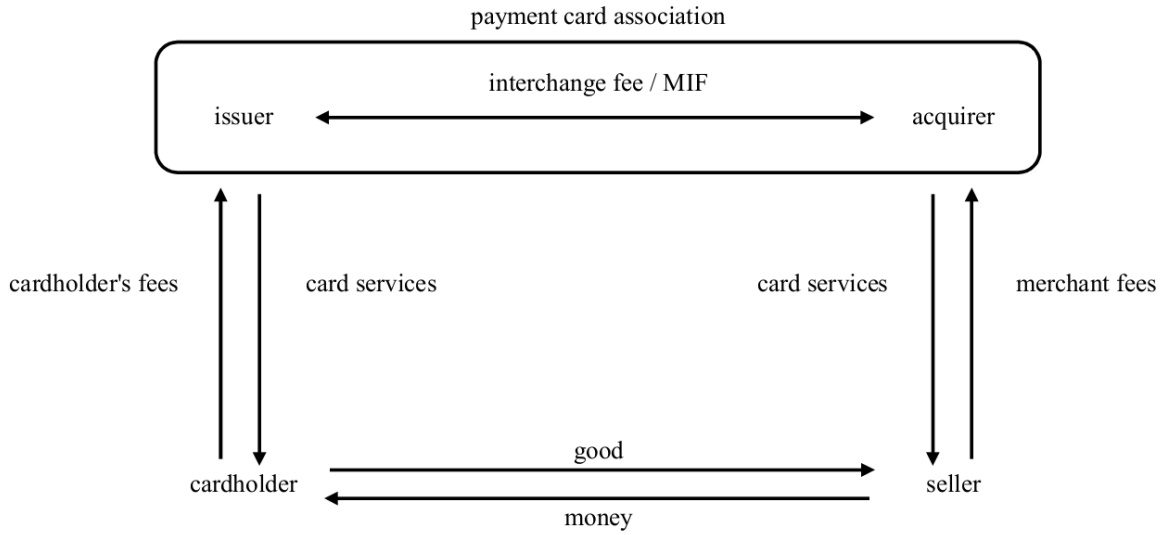

Figure 1. A four-party payment card scheme.[350]

Alternatively, it is possible that an 'open' payment system is operated by an independent payment card company instead of an association of issuing and acquiring banks in which case the payment system involves five parties. In the 2000s, both Visa and MasterCard have restructured themselves as publicly traded companies in response to regulatory and antitrust interventions.[351] In this case, the default interchange fee (or MIF) is set by the payment card company. However, the distinction between a four-party and a five-party payment system is hardly relevant for the purposes of this analysis; henceforth these are treated interchangeably.[352] Figure 2 demonstrates the operation of a five-party payment system.

[350] Filistrucchi et al. 2014, p. 305, Figure 4. Modified by the author.
[351] Ibid, p. 305.
[352] See ibid, note 36.

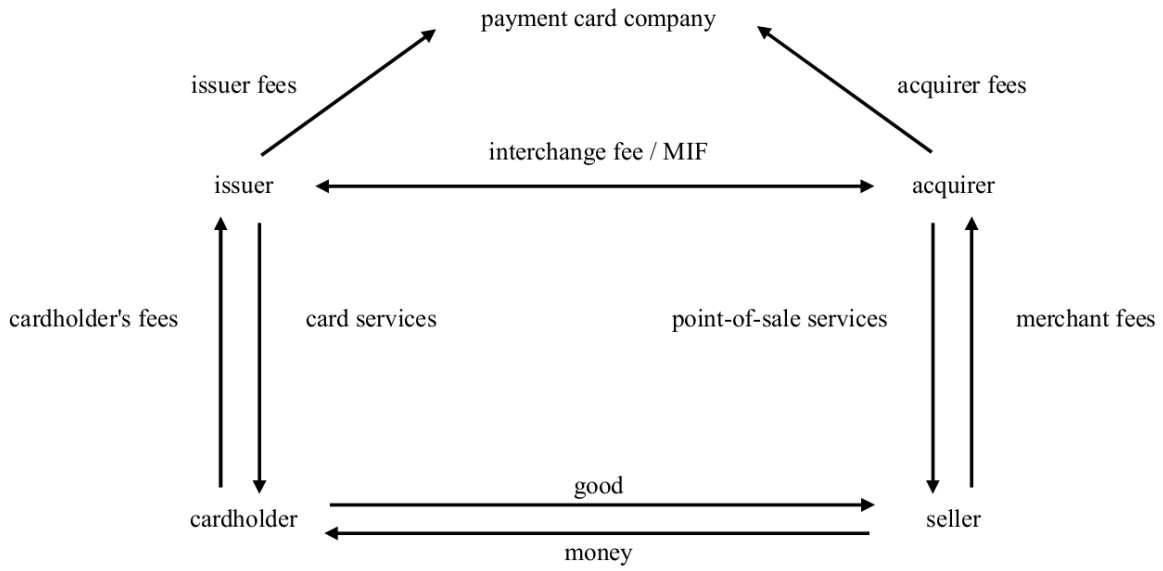

Figure 2. A five-party payment card scheme.[353]

The classic thesis of economic theory behind the interchange fees is that, under an assumption of perfect competition on both the issuing and acquiring side of the payment system, the interchange fee is fully passed through to benefit cardholders, which encourages more cardholders to use the payment card.[354] The payment card association or company operating the payment platform maximises its profits by maximising total output of the payment system, that is, transactions made by its cards; it is therefore beneficial for it to increase the number of cardholders who, on average, are more price sensitive than merchants. The purpose of balancing between the issuing and the acquiring side through interchange fees is to influence the relative prices between cardholders and merchants to increase transactions.[355] It has been argued that in a four-party payment system with the "honor-all-cards" rule[356] but no default interchange fee, issuers would have the incentive to "hold up" acquirers and take advantage of them by demanding unreasonably high interchange fees before proceeding on with the transaction.[357] Accordingly, the banks in a four-party payment system should adopt some collective mechanism to prevent such exploitative behaviour.[358] However, the economics of the payment systems is more complex in reality than in models and the actual impact of interchange fees on

[353] Ibid, p. 306, Figure 5. Modified by the author.
[354] See Baxter 1983. For more recent models on interchange fees, see e.g. Rochet and Tirole 2002. For an overview of the economic literature on interchange fees, see Evans 2011. For recent theoretical research on surcharging and merchant prices and policy recommendations, see e.g. Bourguignon et al. 2019.
[355] Klein et al. 2006, pp. 609-610.
[356] The honor-all-cards rule is a standard rule in payment card systems that obligates merchants to accept all cards of the payment system irrespective of which bank issued the card.
[357] Klein et al. 2006, p. 574.
[358] Baxter 1983, p. 577.

consumer and merchant prices is not usually clear.[359] This is probably the reason why interchange fees remain a controversial topic in the economic literature and competition practice.

Following its investigation into MasterCard's MIF scheme, the Commission adopted a decision[360] in which it concluded that the scheme had restricted competition 'by effect' under Article 101 TFEU by inflating the base for merchant fees; without the MIF the merchant fees would have been lower.[361] The MIF was also not objectively necessary for the operation of the payment card system as was evidenced by other open payment card schemes without a MIF.[362] The Commission remarked that to solve the possibility that issuing banks might hold up acquirers, MasterCard could have adopted a rule that was less restrictive on competition than the MIF such as a prohibition on *ex post* pricing on the banks in the absence of a bilateral agreement between them.[363] Unlike in *Visa International – Multilateral Interchange Fee* decision[364] in which the Commission decided that Visa's MIF scheme satisfied the criteria of Article 101(3) TFEU, the Commission concluded that MasterCard's MIF did not fulfill the conditions for exemption under Article 101(3). The Commission deemed that MasterCard had failed to show the existence of objective efficiencies, to demonstrate that efficiencies outweighed restrictions to merchants and to prove that the MIF were indispensable to maximise system output.[365]

The Commission defined the relevant market in the case by employing the logic that was described above in the discussion of the *Cartes Bancaires* decision. Like in its *Visa International – Multilateral Interchange Fee* decision, the Commission distinguished competition between payment card networks ('inter-system' competition) and competition between individual financial institutions for card-related issuing and acquiring activities, thus making a distinction between an upstream "system market" and downstream "issuing" and

[359] Evans and Mateus 2011, p. 135.
[360] Case COMP/34.579 *MasterCard*, Case COMP/36.518 *EuroCommerce*, Case COMP/38.580 *Commercial Cards*.
[361] Ibid, para 2.
[362] Ibid, para 665.
[363] Ibid, para 554. In the said paragraph the Commission explains that the rule of prohibiting *ex post* pricing "would oblige the creditor bank to accept any payment validly entered into the system by a debtor bank while prohibiting each bank from charging the other bank in the absence of a bilateral agreement on the level of such charges".
[364] Case COMP/29.373 *Visa International - Multilateral Interchange Fee.*
[365] Case COMP/34.579 *MasterCard*, Case COMP/36.518 *EuroCommerce*, Case COMP/38.580 *Commercial Cards*, paras 5-12.

"acquiring" markets.[366] The Commission defined the relevant market in the case to be the national market for acquiring payment cards in the EEA Member States.[367]

However, similarly as in its *Cartes Bancaires* decision and unlike in its earlier *Visa International - Multilateral Interchange Fee* decision, the Commission defined that payment systems compete to persuade financial institutions (not cardholders and merchants) to join their network.[368] By focusing on system adoption by banks rather than adoption and usage of cards by the end-users, the Commission failed to discuss, among other things, multi-homing, that is, use of multiple cards by cardholders and merchants. This had the effect that the Commission could not properly assess competition between 'open' payment systems such as Visa and MasterCard and 'closed' payment systems such as American Express and national debit card schemes. Not defining a single market to encompass both cardholders and merchants was also curious in a sense that the object of the case, the MIF, is a per transaction fee.[369]

The General Court dismissed the MasterCard's action for annulment of the Commission decision and upheld the decision in its judgment[370]. The General Court did not agree with the appellants' arguments that the Commission had wrongly concluded that the setting of the MIF constituted a restriction of competition under Article 101(1) TFEU, and it also concluded that the appellants had not established that the Commission's reasoning in relation to the conditions of Article 101(3) was unlawful.[371] An unusual feature of the case was that in May 2006, during the Commission's investigation, MasterCard had an initial public offering ('IPO') on the New York Stock Exchange. As a result of the IPO, MasterCard became a publicly traded company which modified its corporate structure and governance. The appellants claimed on this basis that MasterCard had ceased to be an association of undertakings and complained that the Commission had wrongly characterised it as such.[372] The General Court rejected this plea, concurring with the Commission that, despite the changes brought about by MasterCard's IPO, the MasterCard had continued to be "an institutionalised form of coordination of the conduct of the banks".[373]

[366] Ibid, paras 278-279.
[367] Ibid, para 329.
[368] Ibid, para 281.
[369] Filistrucchi et al. 2014, pp. 312-313.
[370] Case T-111/08 *MasterCard v Commission*, EU:T:2012:260.
[371] Ibid, paras 187 and 236.
[372] Ibid, para 238.
[373] Ibid, para 259.

Regarding the Commission's view of the relevant market, the appellants submitted that the Commission had erred in finding that there was a distinct acquiring market. The appellants promoted the single-market approach and argued that a single relevant market should be defined as the four-party payment card system provided a single service at the joint demand of cardholders and merchants.[374] The General Court rejected this claim, stating that while indeed there was interaction between the issuing and acquiring sides, such as the complementary nature of issuing and acquiring services and the presence of indirect network effects, services provided to cardholders and merchants could be distinguished from each other, and that cardholders and merchants exerted separate competitive pressure on the issuing and acquiring banks.[375] The General Court thus explicitly endorsed the Commission's definition of a "system market" and separate issuing and acquiring markets in payment card markets.

On appeal, the Court of Justice upheld the General Court's ruling in its judgment[376], likewise dismissing the MasterCard's appeal. Like the Commission and the General Court, the Court of Justice did not consider the MIF as objectively necessary for the operation of the MasterCard's payment system, stating that the fact that its operation is simply more difficult to implement or less profitable without a restriction cannot be deemed to give that restriction the 'objective necessity' required in order for it to be classified as ancillary.[377] Whether the MIF was to be considered 'indispensable' to the improvement of production or distribution or to the promotion of technical or economic progress, while allowing consumers a fair share of the resulting benefits, had to be determined under the framework of Article 101(3) TFEU. On this part, the Court of Justice concluded that the General Court had not erred in law by upholding the Commission's conclusion that the appellants had not demonstrated that the MIF satisfied the conditions of Article 101(3).

Though it affirmed the conclusions of the General Court, the Court of Justice however made important remarks on analysis of restrictions of competition 'by effect' under Article 101(1) and provided novel interpretation on assessment of efficiencies under Article 101(3) in the context of two-sided markets.[378] Firstly, the Court of Justice extended the contextual analysis

[374] Ibid, para 174.
[375] Ibid, paras 176-177.
[376] Case C-382/12 P *MasterCard v Commission*, EU:C:2014:2201.
[377] Ibid, para 91. An ancillary restriction is a restriction which falls outside Article 101(1) TFEU because it is directly related and necessary to the implementation of a main operation that is not anticompetitive in nature, see ibid, paras 89-90 and the case law cited therein, and also Case T-112/99 *Métropole télévision (M6) v Commission*, EU:T:2001:215, paras 104-110.
[378] Pradelles and Scordamaglia-Tousis 2014, p. 141.

to the assessment of effect restrictions in two-sided markets, in the same fashion as it did with respect to object restrictions in *Cartes Bancaires*:

> "In order to determine whether coordination between undertakings must be considered to be prohibited by reason of the distortion of competition which it creates, it is necessary […] to take into account any factor that is relevant, having regard, in particular, to the nature of the services concerned, as well as the real conditions of the functioning and the structure of the markets, in relation to the economic or legal context in which that coordination occurs, *regardless of whether or not such a factor concerns the relevant market*."[379]

Again, the Court of Justice pointed out the need for contextual analysis regardless of the specific definition of the relevant market. The Court of Justice did not take a stand on market definition itself as that point was not directly challenged in the appeal, but it still recognised that the economic and legal context of the coordination between acquiring and issuing banks in the MasterCard's open payment system included the system's two-sided nature, particularly since it was undisputed that there was interaction between its two sides.[380]

Secondly, the Court of Justice provided novel interpretation on assessment of efficiencies under Article 101(3) TFEU in the context of two-sided markets. There are three types of efficiencies that are used in industrial organization theory and microeconomics in general.[381] First, there is allocative efficiency that results from an efficient distribution of economic resources between different goods and services. This maximises the total surplus of consumers and producers and ensures that the optimal amount of goods and services are produced in the economy. Second, there is productive efficiency that results from producing goods and services at the lowest cost possible. Thereby, as little as possible of society's scarce resources is expended in their production. Third, there is dynamic efficiency that results from stimulating technological research and development. This eventually allows the production of new and better goods and services. Technically, productive and dynamic efficiencies are components of allocative efficiency but it is common to distinguish between these efficiencies.[382] However, the role of productive and dynamic efficiencies as elements of allocative efficiency is reflected in the wording of the first condition of Article 101(3) TFEU under which a restriction must contribute to "improving the production or distribution of goods or to promoting technical or economic

[379] Case C-382/12 P *MasterCard v Commission*, EU:C:2014:2201, para 177. Emphasis added.
[380] Ibid, paras 178-179.
[381] See Cabral 2000, pp. 26-29.
[382] Ibid, pp. 28-29.

progress" to satisfy that condition. The Court of Justice has further added that this improvement must show 'appreciable objective advantages' of "such a character as to compensate for the disadvantages which they cause in the field of competition".[383]

In *MasterCard*, the central efficiency argument of the MasterCard was that the MIF maximised system output by balancing cardholder and merchant demands.[384] The MasterCard further claimed that the MIF maximised the overall benefits of the system to merchants and cardholders "by reducing costs, increasing services levels and contributing to overall economic welfare".[385] Basically, this argument was built on a premise that the MIF contributed to improving allocative efficiency by distribution of benefits to cardholders and merchants. The Commission recognised the link between economic efficiency and consumer benefits and, accordingly, determined that the analysis of whether the alleged increase in system output satisfied the first condition of Article 101(3) was to be examined together with the second condition of Article 101(3) ("allowing consumers a fair share of the resulting benefit"), that is, the question of whether there was a sufficient pass-on of benefits to cardholders and merchants.[386]

The factor complicating any assessment of allocative efficiency in two-sided markets is that, because of network effects, the two sides of the market are interdependent and there is a possibility that restrictions on one side of a platform may harm users on that side but at the same time benefit users on the other side of the platform.[387] For example, in the presence of positive network effects, if more users join the platform because of the benefit they gain from restrictions, it might increase the utility of the side that was harmed to some extent, possibly even entirely offsetting the harm suffered from restrictions. In the case of payment card systems, it might be that an increase in interchange fees or MIFs harms merchants but also encourages more cardholders to use the card if the increased fees are passed through to cardholders as benefits, thereby possibly increasing the number of transactions of the payment system. However, welfare effects of any such restrictions are case-specific, as economics does not provide any general basis for the assumption that increases in price will always pass through from one side of a platform to the other in the form of lower prices or higher quality.[388]

[383] Joined Cases 56/64 and 58/64 *Consten and Grundig v Commission*, EU:C:1966:41.
[384] Case COMP/34.579 *MasterCard*, Case COMP/36.518 *EuroCommerce*, Case COMP/38.580 *Commercial Cards*, para 688.
[385] Ibid, para 689.
[386] Ibid, para 693.
[387] Katz and Sallet 2018, p. 2145.
[388] Ibid, p. 2174.

Therefore, it is not clear how antitrust authorities should weigh gains and losses between different sides of a platform resulting from anticompetitive conduct on one side of the platform.

Two different approaches to address this issue have been presented in the literature. The 'net-effects analysis' maintains that all consumer groups on different sides of the platform should receive equal weight and that the focus of analysis of anticompetitive restrictions should be on their net welfare effects. The 'separate-effects analysis' in turn proposes that harm from restricted competition to one consumer group cannot be offset by benefits to some other group as each consumer group is entitled to benefits of competition.[389] Katz and Sallet promote the separate-effects analysis, arguing that the link between the net price and consumer welfare is not sufficiently strong to justify excluding the price structure from the effects analysis and that the separate-effects analysis better accommodates the central proposition of the theory of two-sided markets that both the price level and the price structure matter for the competitive analysis and welfare effects of the platforms.[390] Moreover, Katz advises against using changes in output such as transactions volume as a proxy for changes in consumer welfare and argues that this amounts to another fallacy from applying one-sided logic to two-sided markets:

> "Although not on Wright's (2004) original list, the use of transactions volume as a welfare proxy is another example of the fallacy of applying one-sided logic to two-sided markets. In a one-sided market, an increase in output holding quality constant typically corresponds to an improvement in consumer welfare absent price discrimination. But in a two-sided market, divergences between changes in transactions volumes and changes in consumer welfare can arise because the interests of users on opposites sides of a platform generally are not aligned, and a platform may engage in conduct that exploits this fact."[391]

In addition to allocative efficiency, the question of distribution of benefits between different sides of a platform is linked to the question of fairness. Who should benefit from competitive markets the most: the society, consumers in general or some groups of consumers over others? This question has an interesting (and vast) ethical dimension which is not explored further in

[389] Ibid, p. 2162.
[390] Ibid, pp. 2167-2168.
[391] Katz 2019, p. 146. See also Schwartz and Vincent 2006, who have shown in the context of a credit card network how volume of card usage in relation to cash and welfare effects of a payment system are affected by rebates and a ratio of cash users to card users in the presence of a "no-surcharge" rule (i.e. a common prohibition to merchants to charge higher prices to those consumers who prefer to pay by card rather than by some other form of payment such as cash).

this context.[392] Instead, this analysis is limited to welfare economics, where a standard measure of allocative efficiency is 'Pareto optimality' (or 'Pareto efficiency'). Pareto efficiency means that there is no allocation of resources which would increase the utility of one person without making someone else worse off.[393] Pareto optimality is a minimum notion of efficiency in a sense that it is a necessary but not sufficient condition for efficiency; it allows for severely unequal and unfair distributions of resources (for instance, an extreme outcome in which one person has all the resources of the economy would be Pareto optimal because any redistribution of resources would make this person worse off). Hence, only some Pareto efficient outcomes out of the many that usually exist may be socially desirable or "fair" under some other criteria.[394]

Despite these limitations, Pareto efficiency remains a useful concept when showing efficiency of an allocative mechanism; efficient mechanisms with other desirable properties usually satisfy also Pareto optimality. Moreover, Pareto efficiency has a central role in the two fundamental theorems of welfare economics, which demonstrate its necessity for socially optimal distributions of resources.[395] The first fundamental theorem of welfare economics informally states that under certain assumptions (i.a. perfect information and no externalities) any competitive market equilibrium is Pareto efficient. The second fundamental theorem of welfare economics, which is the reverse of the first theorem, informally states (under more restrictive assumptions) that any Pareto optimal equilibrium can be reached through the operation of the competitive market mechanism given some initial allocation of resources. These results in their mathematical form are powerful because they provide a formal theoretical foundation for the argument of Adam Smith and later economists that the market mechanism maximises social welfare through optimal allocation of resources.[396] In practice, however, the applicability of the theorems is limited because their assumptions do not hold in real markets and, moreover, because it might not be possible to redistribute all the resources of the society to reach some

[392] Although many criteria for allocative efficiency and fairness have been presented in the economics and philosophy literature (perhaps most famously by Rawls 1971), the question of which alternatives are socially preferable to some other alternatives remains open in welfare economics and social choice theory, see e.g. Feldman and Serrano 2006, pp. 217-227.
[393] Technically, this is strong Pareto efficiency. Weak Pareto efficiency requires only that there is no allocation which would increase the utility of all persons without making someone worse off. All market outcomes which are strongly Pareto efficient are also weakly Pareto efficient but not vice versa. See e.g. Myerson 1991, p. 378.
[394] For example, Feldman and Kirman 1974 have shown that a criterion of fairness as "non-envy" might be contrary to Pareto efficiency: even if economic transactions themselves are fair, they cannot be expected to establish or preserve allocative fairness.
[395] The original theorems were established by Arrow (1951) and Debreu (1959).
[396] See e.g. Feldman and Serrano 2006, pp. 59-70, for a discussion and demonstration of these theorems.

desired socially optimal equilibrium.[397] For instance, because of externalities such as network effects, it is not clear to which extent the market mechanism creates Pareto efficient outcomes in two-sided markets.[398]

Considering the above discussion on necessity of Pareto optimality for efficient distribution mechanisms, it is difficult to envisage how any balancing of benefits and harms between the two sides of a two-sided platform could improve social welfare if this balancing was not Pareto improving[399]. Therefore, it can be concluded that in order to be welfare-enhancing, any distribution of benefits and harms between different sides of a platform must be a Pareto improvement. This assessment of welfare effects obviously requires taking the price structure into account. Otherwise, there is a possibility that a restriction might result in one group of users suffering a net harm and another group gaining a net benefit even without any discernible net effect in the total price level.[400] It follows that the net-effects analysis, in general, must be rejected because it might ignore market outcomes that are actually welfare-reducing. Hence, the separate-effects analysis should be adopted as the basic framework for analysis of welfare effects in two-sided markets. However, it should be noted that the condition that any efficiencies must be Pareto improving does not mean that in practice it must be shown that every individual would be better off. The Court of Justice has affirmed in its case law that under Article 101(3) TFEU, "it is the beneficial nature of the effect on all consumers in the relevant markets that must be taken into consideration, not the effect on each member of that category of consumers".[401]

In essence, the framework of Article 101(3) TFEU incorporates the concept of Pareto efficiency in its second condition which requires that in order to be exempt from the application of Article 101(1) a restrictive agreement must (in addition to fulfilling the other three conditions of Article 101(3)) allow consumers "a fair share of the resulting benefit". The Commission has equated this condition to Pareto improvement as is evident from the Commission's *Article 101(3) Guidelines* in which the Commission has stated that "the pass-on of benefits must at least compensate consumers for any actual or likely negative impact caused to them by the restriction

[397] Sen 1993, p. 522, have remarked that it is a sociological fact that "enthusiastic advocates of the market mechanism are typically not particularly revolutionary in demanding radial redistributions of ownership".
[398] Greenwald and Stiglitz 1986 have shown that in the presence of externalities market equilibria are generally not Pareto efficient and identified a framework for analysing when policy interventions are Pareto improving.
[399] Pareto improvement increases the utility of at least one person without making anyone worse off. Pareto improvements can only exist for those outcomes which are not (strongly) Pareto efficient.
[400] Katz and Sallet 2018, p. 2161.
[401] Case C-238/05 *Asnef-Equifax v Asociación de Usuarios de Servicios Bancarios (Ausbanc)*, EU:C:2006:734, para 70, and Case C-382/12 P *MasterCard v Commission*, EU:C:2014:2201, para 236.

of competition" and that "the net effect of the agreement must at least be neutral from the point of view of those consumers directly or likely affected by the agreement".[402]

The Commission has considered that the assessment of efficiencies must be made within the confines of the relevant market. This means that efficiencies generated by a restrictive agreement must in general occur in the same relevant market as the anticompetitive effects of the agreement and be sufficient to outweigh those effects there. Negative effects on consumers in one market cannot normally be balanced against and compensated by positive effects for consumers in another unrelated market.[403] Pursuant to *Article 101(3) Guidelines*, there is only one exception to this rule. The Commission considers that efficiencies on separate but related markets can be taken into account if the group of consumers affected by the restriction and benefiting from the efficiency gains are substantially the same (so-called 'consumer commonality').[404] In principle, this limited exception or the Commission's approach do not allow compensating anticompetitive effects of restrictions on one side of a two-sided market with benefits of those restrictions on another side of that market if those sides are defined as separate but interdependent markets. The definition of the relevant market thus limits the scope of efficiencies that can be considered under Article 101(3); as a result, defendants may be unduly deprived of the chance to benefit from it.[405]

In accordance with the *Article 101(3) Guidelines*, the General Court adopted the separate-effects analysis in *MasterCard* and concluded that both user groups, cardholders and merchants, had to be compensated under the second condition of Article 101(3):

> "[A]s merchants constitute one of the two groups of users affected by payment cards, the very existence of the second condition of Article [101(3) TFEU] necessarily means that the existence of appreciable objective advantages attributable to the MIF must also be established in regard to them."[406]

[402] *Article 101(3) Guidelines*, para 85.
[403] Ibid, para 43.
[404] Ibid. See also Case T-86/95 *Compagnie générale maritime and Others v Commission*, EU:T:2002:50, para 343, where the General Court determined, in the context of consumer commonality, that advantages may arise not only for the relevant market but also "for every other market on which the agreement might have beneficial effects, and even, in a more general sense, for any service the quality or efficiency of which might be improved by the existence of that agreement".
[405] Pradelles and Scordamaglia-Tousis 2014, p. 146.
[406] Case T-111/08 *MasterCard v Commission*, EU:T:2012:260, para 228.

The General Court's reasoning on this point was not discussed by the Court of Justice on appeal.[407] However, from the manner how the Court of Justice addressed the complaint of the appellants that the General Court did not give a reason why merchants and consumers must benefit from the same share of the profit resulting from the MIF, it is clear that the Court of Justice endorsed the General Court's separate-effects analysis. The Court of Justice noted that the complaint was based on "a misreading of the judgment under appeal" and that the General Court "did not in any way find that each group of consumers should benefit from the same share of that profit, but merely indicated that, as merchants constitute one of the two groups of users affected by payment cards, they should *also* enjoy appreciable objective advantages attributable to the MIF".[408] The Court of Justice concluded that, by using the word 'also', the General Court had thus correctly indicated that merchants had to enjoy the MIF 'as well as' cardholders but not 'to the same extent' as them.[409]

Despite accepting the General Court's rejection of the appellants' efficiency plea on its facts and dismissing the appeal in its entirety, the Court of Justice discussed in depth how efficiencies should be assessed in the context of two-sided markets and provided novel interpretation which departs from the Commission practice in three fundamental respects.[410]

First, the Court of Justice determined that in order to assess whether the first condition of Article 101(3) can be fulfilled in case of a two-sided system, it is necessary to take into account all the objective advantages flowing from the restrictive measure "not only on the market in respect of which the restriction has been established, but also on the market which includes the other group of consumers associated with that system".[411] This effectively means that both sides of a two-sided market matter to the assessment of efficiencies under Article 101(3). The Court of Justice did not accept the appellants' argument that the General Court had wrongly ignored the two-sided nature of the MasterCard's payment system; the Court of Justice deemed instead that the General Court had specifically recognised that there was interaction between the two sides of the system and taken its two-sided nature appropriately into account in its analysis.[412] Likewise, the Court of Justice concluded that the General Court had also taken the two-sided nature of the system into account when examining the advantages that merchants enjoyed from the MIF.[413]

[407] Whish and Bailey 2018, p. 170, note 142.
[408] Case C-382/12 P *MasterCard v Commission*, EU:C:2014:2201, para 248. Emphasis added.
[409] Ibid.
[410] Pradelles and Scordamaglia-Tousis 2014, p. 148.
[411] Case C-382/12 P *MasterCard v Commission*, EU:C:2014:2201, para 237.
[412] Ibid, para 238.
[413] Ibid, para 239.

Second, the Court of Justice established that the proof of a "minimum of efficiencies" on the side that is harmed by a restriction is required for the efficiencies on the other side of the platform to be relevant for the analysis.[414] In the light of the above principle that the two-sided nature of the system needs to considered in the assessment of efficiencies, the General Court was required to take into account all the objective advantages from the MIF "not only on the relevant market, namely the acquiring market, but also on the separate but connected issuing market".[415] Should the General Court have found any appreciable objective advantages to merchants from the MIF (even if those advantages could not in themselves compensate for the effects of the restriction), then all the advantages on both consumer markets (including that of the cardholders) could have justified the MIF if those advantages did together compensate for its restrictive effects.[416] This Court of Justice's approach can to be understood to relax the strict standard of the separate-effects analysis; even though both sides of the market must enjoy objective advantages, those advantages do not need to compensate fully for the disadvantages on the side of the market which is harmed by the restriction.

Third, the Court of Justice determined that if the "minimum of efficiencies" requirement is met, then efficiencies on both sides of a two-sided market can be taken into account in the assessment of efficiencies regardless of any consumer commonality.[417] The Court of Justice acknowledged that, in the absence of appreciable objective advantages in the relevant market, the advantages on a separate but connected market associated with a two-sided system cannot in themselves compensate for the disadvantages resulting from the restriction, in particular where the consumers on those markets are not substantially the same.[418] Thereby, the Court of Justice effectively established another exception (to complement that of consumer commonality in one-sided markets and applying only to two-sided markets) to the rule that negative effects on consumers in one market cannot be compensated by positive effects in another unrelated market.

Regarding the MasterCard's MIF scheme, however, the Court of Justice concluded that as the General Court had determined that there was no proof of the existence of objective advantages to merchants from the MIF, it was not necessary to examine in those circumstances the MIF's

[414] Pradelles and Scordamaglia-Tousis 2014, p. 148.
[415] Case C-382/12 P *MasterCard v Commission*, EU:C:2014:2201, para 240.
[416] Ibid, para 241.
[417] Pradelles and Scordamaglia-Tousis 2014, p. 148.
[418] Case C-382/12 P *MasterCard v Commission*, EU:C:2014:2201, para 242.

advantages to cardholders, since they could not in themselves compensate for the disadvantages resulting from the MIF.[419] It was thus the appellants' failure to show any objective advantages to merchants resulting from the MIF that denied the Court of Justice a chance to apply its new exception rule to the case. Nonetheless, *MasterCard* clarified the framework of assessment of efficiencies under Article 101(3) and enabled, in the context of the two-sided platforms, the recognition of a broader range of efficiencies in separate but interdependent markets when compared with the case law that preceded the judgment.[420] Combined with the contextual analysis of object and effect restrictions that was extended to two-sided platforms by *Cartes Bancaires* and *MasterCard*, respectively, this serves to lessen emphasis on market definition and reduce the problems associated with it in two-sided markets. Such approach is therefore to be welcomed.

As for the MIFs, they continue to be objects of regulatory and antitrust interventions in the EU. In April 2015, the EU adopted regulation[421] to cap the interchange fees from December 2015 for both domestic and cross-border consumer credit and debit card transactions within the EU. In January 2019, the Commission fined MasterCard 570 million euros for its (pre-December 2015) cross-border acquiring rules which infringed Article 101(1) by preventing merchants in EU countries with high domestic MIFs from benefiting from lower service fees offered by banks in EU countries with lower domestic MIFs.[422] In April 2019, the Commission accepted commitments from Visa and MasterCard to lower their inter-regional MIFs which are interchange fees that are applied to payments made within the EEA area with credit and debit cards issued outside the EEA.[423] In April 2020, the Court of Justice gave a preliminary ruling on a case *Gazdasági Versenyhivatal v Budapest Bank Nyrt. and Others*[424] which was referred to it by the Supreme Court of Hungary and which concerned the interpretation of Article 101(1) TFEU in the context of an interbank agreement on interchange fees. The case concerned the Hungarian competition authority's investigation into an agreement of Hungarian financial institutions belonging to Visa's and MasterCard's payment card systems that fixed the level of interchange fees and whether that agreement could, in principle, be classified as a restriction of competition 'by object'. In its analysis, the Court of Justice reiterated many of the principles of *Cartes Bancaires* and emphasised the need for the contextual analysis of restrictive agreements

[419] Ibid, para 243.
[420] Pradelles and Scordamaglia-Tousis 2014, p. 152.
[421] Regulation (EU) 2015/751 of the European Parliament and of the Council of 29 April 2015 on interchange fees for card-based payment transactions, published in OJ 2015/L 123/01.
[422] Case AT.40049 *MasterCard II*, decision of 22 January 2019.
[423] Case AT.39398 *Visa MIF* and Case AT.40049 *MasterCard II*, decision of 24 April 2019.
[424] Case C-228/18 *Gazdasági Versenyhivatal v Budapest Bank Nyrt. and Others*, EU:C:2020:265.

concerning two-sided systems. The Court of Justice did not rule out the possibility of classifying the interbank agreement in question as an agreement which restricted competition 'by object' but stated, however, that the agreement could not be classified as such unless that agreement could be regarded as posing a sufficient degree of harm to competition, which was a matter for the referring court to determine.[425]

5. Conclusions

In this thesis, I have presented the economic theory underlying competition law in general and two-sided markets in particular and, in the light of that theory, discussed the role of market definition in antitrust analysis and the Court of Justice case law on two-sided markets in cases concerning payment card systems. The Court of Justice's seminal rulings in cases *Cartes Bancaires* and *MasterCard* show that it has paid attention to insights of economic research. Those judgments leave no doubt that the two-sided nature of platforms matter for their competitive analysis under the EU competition rules. Unlike the General Court, which endorsed the Commission's market definition practice of payment card systems, the Court of Justice did not address the issue of market definition explicitly as it was not specifically asked to do so on appeal in those cases. Despite avoiding a discussion on market definition, the Court of Justice however emphasised the need for contextual analysis of restrictive agreements under Article 101 TFEU concerning two-sided platforms regardless of the definition of the relevant market. This is a rather flexible approach that in general places less emphasis on market definition in two-sided markets, thus avoiding some of the potential problems associated with that process. The case law of the CJEU, however, offers only limited guidance for practitioners of competition law; many questions remain open awaiting new case law which is sure to follow as the importance of digital platforms increases in the economy.

There is no reason to doubt that the EU competition rules as they are provided in the Treaties would not be fit to address the specific issues of two-sided markets arising in competition analysis of multi-sided platforms. The rules themselves are very general in nature and quite adaptive in their interpretation as the CJEU case law and the Commission's decision-making practice over the years have shown. However, the Commission should clarify its practice on certain dimensions of competitive analysis of multi-sided platforms preferably by way of guidelines or notices now that it has extensive experience on dealing with two-sided markets.

[425] Ibid, para 86.

These specific questions in the area of market definition include whether a 'single' two-sided market or two separate but 'interrelated' markets should be defined, how to adjust the SSNIP test to take network effects into account and how to define the relevant market in the presence of a zero price on one side of the platform, which is a common practice in multi-sided platforms. Some recommendations have been presented in this thesis in addition to which a vast amount of academic literature and international debate between competition authorities exists on the issue.

On 9 December 2019, Vice-President of the European Commission and European Commissioner for Competition Margrethe Vestager delivered a speech in a competition conference in Brussels in which she announced that the Commission is planning to review its *Notice on Market Definition*.[426] Since the publication of that notice over twenty years ago, the single market has developed greatly as many markets which previously were national have become European-wide. At the same time, econometric techniques have been developed and refined to make better use of economic evidence in the market definition practice. Globalisation and digitisation are trends which increasingly continue to transform markets while creating new challenges for defining geographic and product markets. Suggesting the Commission should make it clearer that market definition is not an end in itself, Vestager described the proper role market definition should play in the competition analysis of markets – digital or otherwise:

> "Defining markets isn't like agreeing the border between two countries, by drawing a line on a map. It's more like charting a coastline. The shape is already there – our job is just to measure it as accurately as we can. And nothing we do will change the shape of that coastline itself."[427]

The review of the *Notice on Market Definition* offers a great opportunity to address the specific issues of market definition in two-sided markets as the Commission repositions itself in response to challenges of the digital age. Some of these challenges were addressed in a report on competition policy in the digital era that was published in Spring 2019 and written by three special advisers on an assignment by Commissioner Vestager. One of the key takeaways of the report was that the Commission needs to adapt and refine its methodology in defining the relevant markets and measuring market power of digital platforms.[428]

[426] European Commission 2020.
[427] Ibid.
[428] Crémer et al. 2019, pp. 3-4.

Evans has observed that, by now, the highest courts in the three largest jurisdictions (the United States, EU and China) have concluded that two-sided features are relevant for assessing whether restraints are anticompetitive. For this reason, the debated question should no longer be whether both sides of the market should matter for competitive assessment but rather how they should be considered in that assessment and what tools should be used in the analysis.[429] It is clear from the discussion of this thesis that multi-sided platforms will continue to offer fresh ground for further legal and economic research and to influence the case law and competition practice for many years to come.

[429] Evans 2019, p. 338.