

Competition and regulation in markets for goods and services: A survey with emphasis on digital markets

Nikolaos Vettas ¹

Athens University of Economics and Business and CEPR

nvettas@aueb.gr

October 12, 2015

¹ Author affiliation: Athens University of Economics and Business, Foundation for Economic and Industrial Research and CEPR; nvettas@aueb.gr. This survey is prepared in the context of the COEURE (Cooperation on European Research in Economics) Coordination Action, funded by the European Commission's FP7 SSH Programme and aiming at evaluating European research in economics from the perspective of its contribution to key EU economic policy issues (<http://www.coeure.eu/>). The author is grateful to Jacques Crémer, Marc Ivaldi, Kai-Uwe Kühn, Damien Neven, Lars Sørsgard, Yossi Spiegel, Frode Steen, and participants in the September 2015 COEURE workshop in Brussels for their very helpful ideas, suggestions, comments and criticism. All errors and shortcomings, however, are exclusively the responsibility of the author. Apologies are due in advance to the researchers whose contributions to the literature have not been presented in this survey as fully or accurately as they should, either by mistake or due to space limitations.

Abstract

In the last couple of decades, competition policy has been receiving increasingly higher attention and has obtained a central role in micro-economic policy in Europe. Ensuring that markets work as competitively as possible is viewed as key for economic growth and welfare. As much progress has been made in the academic research that studies and shapes competition policy, the nature of competition in markets is also evolving continuously and new issues emerge as important. Probably the most important novel features are related to the increase in the size of the digital sectors of the economy, and especially to the way that digital technologies and e-commerce practices revolutionize essentially all other sectors of the economy. These developments naturally pose some new important challenges for research. One key idea, on the theory modeling side, is that with digital markets and technologies we are more likely to have intense competition ‘for the market’ rather than competition ‘in the market’. It follows that we need models that are more dynamic and incorporate to a larger extent, network effects, other non-convexities, and uncertainty. At the same time, it is very important, even within the current developments, that one does not ignore the lessons of earlier and current literature, especially in core areas like pricing and vertical relations: all markets share common features in their analysis, and scientific progress should be as continuous as possible. On the empirical research side, the availability of relevant data can be expected to increase very significantly, due to the fact that more transactions will be electronic and thus can be recorded more easily. The need and opportunity for few empirical methods, given the level and nature of available data, thus emerges. Finally, new technologies tend to minimize the distances between buyers and sellers in markets and facilitate information flows; ‘single market’ issues therefore come to the forefront and the analysis of these from an economic perspective certainly is not uncontroversial. This challenge becomes even more clearly a priority since the Digital Single Market has been announced as one of the core areas by the European Commission.

1. Introduction

Competition and innovation have proved over time to be the two, closely interrelated, pillars of growth. Allowing access to goods and services of higher quality and at a lower cost is the way for sustainable increases in the standard of living of the population to be obtained. Over the last decades, in particular, economic policy has focused systematically and as a matter of priority on how to protect and strengthen the factors that facilitate both competition and innovation. Importantly, the relevant policy design questions have to be taking into account that the relation between the two economic forces is complex and certainly not monotonic. In a static perspective, competition among firms allows consumers to have access to goods that are less expensive and of higher quality, while overall reducing profit levels. In a more dynamic perspective, however, it is exactly the motive of profit that makes firms proceed in their innovative activities, either in a product innovation (that is, offering new and better products) or a process innovation (that is, producing goods more efficiently) sense.

Policy at the European Union (EU) level has made the more efficient functioning of products' markets a clear priority. More generally, and worldwide, in the last couple of decades we have seen very important progress both on the competition policy and the innovation policy fronts. This has led to a more systematic, clear and consistent approach to the design and application of policy, to a gradual convergence of views, and in particular to bringing the legal and the economics-based approaches of the issue closer to each other, overall leading to a more efficient functioning of markets and to increases in social welfare. In fact, how structural reforms that improve the functioning of markets can lead to sustainable growth is the focus of the modern economics of growth (see e.g. Aghion and Akcigit, 2015, and references therein).

Regarding competition policy itself, it has grown from an area that was rather peripheral and of secondary importance within the broader economic policy and perhaps relatively more important only in the US (building on the more than century-long tradition that followed the Sherman Act of 1890), into one of the most active and important areas in micro policy. In particular, starting in the mid 1980s, the explosion of important research in industrial organization (IO) economics has been gradually and naturally blended with developments in competition policy and law. This research in IO, in relation to developments in game theory and information economics (with its first wave of key contribution reflected in the classic work of Tirole, 1988), has contributed towards narrowing the gap between the more formalistic and the 'Chicago school' approaches, and has proved very fruitful.²

² This earlier work is also summarized in relevant chapters in Schmalensee and Willig, 1989. More recent texts, like Belleflamme and Peitz, 2010, nicely blend new important contributions into the past stock of

Over the last decade, progress in competition policy in the EU has been made, in a number of important fronts, both at the level of the European Commission (DG-Competition) and the more decentralized level of the National Competition Authorities (NCAs). Recently, a set of new and important challenges have appeared for the application of competition policy, specifically in the context of how markets work in the 'digitalized' economy and electronic trade.³ The efficient functioning of the digital and on-line markets is of high importance for economic welfare and is expected to become increasingly so in the future, therefore progress in the related research and policy areas should be of high priority. Importantly, not only is it true that digital markets, more narrowly defined, are an increasingly larger part of the economy, but also that the new technologies tend to change in important ways how essentially all other markets work.⁴ For instance, regarding retail sales, 'cross-channel' retail sales in Europe (that is, purchases that consumers begin, using a digital channel, but do not complete online) are expected to reach €704 billion by 2020, up from €457 billion in 2015; combined with online sales, these cross-channel sales are expected to reach €947 billion, with the result that 53% of total European retail sales over the next five years will be web-impacted.⁵ The present survey focuses, therefore, on how the literature examines matters related to the economic phenomena that become important specifically due to the development of digital markets, and shape the basis for competition policy. On this particular policy front, we have seen a series of recent and high profile cases at the EC against the largest companies in the digital or high technology sectors. Incidentally these large companies happen to be in most cases U.S. based, creating perhaps some secondary issues.

From an economics perspective, a key distinguishing feature of trade in the digitalized world is the ability of sellers and buyers to have access to some important information about their trading partners in ways that, for practical reasons, are essentially impossible in traditional markets. As a result, with constraints and incentives for the markets participants becoming significantly modified, equilibrium strategies and outcomes are also expected to change. In

knowledge in IO, while how developments in IO theory have shaped competition policy can be found in texts like Motta, 2004.

³ See e.g. a presentation by A. Italianer (2014), summarizing the key issues.

⁴ See e.g. Cohen, Garibaldi and Scarpetta (2004).

⁵ According to a survey by Forrester Research published in July 2015. It is also expected that Northern European countries will see more of their total retail sales impacted by the Web compared with southern European markets, while the UK will have the largest proportion of web-impacted sales by 2020.

<https://www.forrester.com/Web+To+Influence+More+Than+Half+Or+947+Billion+Of+European+Retail+Sales+By+2020/-/E-PRE8284>

turn, competition policy also has to take a stand in a number of issues that were not present in traditional markets or were much less important.⁶

More specifically, one of the main areas that pose new challenges in their analysis is related with the significantly enhanced ability that firms have to price differently to different clients and under different conditions in a digitalized environment. Possible competition restrictions in e-commerce include geographical targeting both for the digital content and for the online sale of goods. Online sellers may sell goods to different countries using terms that may differ substantially across countries - this also includes the frequent practice of directing buyers from different areas to different websites and also blocking digital content, such as sports, and media such as movies. Often an important part of the online distribution of digital content takes place through detailed licensing arrangements that include explicit territorial restrictions.

Related to the above matters are also 'parallel trade' restrictions, in e-commerce and otherwise, that prevent a distributor from selling a good outside a particular country. It is often the case in practice that retailers are prevented from distributing a service or good in a certain territory as a result of a silent understanding or of a particular contractual restriction. A related recent phenomenon of increasing importance is that of imposing limitations on the sales through third party platforms (or 'marketplaces'). These limitations include the sale through websites that operate in different countries and the application of most favoured nation (MFN) clauses.

More broadly, pricing restrictions and other vertical restraints such as resale price maintenance (RPM) and types of MFNs clauses have emerged as quite important in recent competition policy practice. In fact, NCAs in different EU member states have reached decisions that appear to be moving in opposite directions, especially in the area of vertical pricing practices, a clear sign that a more solid scientific basis is needed for the comprehension and analysis of such cases.

In addition to competition policy objectives, a stated core goal in the EU is the promotion of the 'single market'.⁷ This objective is often served by the application of competition and other specific policy measures, however, it is often interpreted as a separate goal in itself. It can be viewed in a narrower or a broader way. The narrower way that is sometimes used to view the single market objective is that all buyers should have access to all the products and services at the same terms regardless of the member state where they reside. In close relation to the topic of this survey, the Single Digital Markets objective has been set by the current European

⁶ On recent issues in the the development of digital markets, see also Ng (2014).

⁷ See http://ec.europa.eu/internal_market/20years/singlemarket20/facts-figures/what-is-the-single-market_en.htm

Commission (EC) as one of its top priorities, as also detailed in its May 2015 Communication ⁸, while the Commission launched at the same time an antitrust competition inquiry into how the e-commerce sector functions in the EU. The inquiry, as already announced by Competition Commissioner Margrethe Vestager in March, will allow the Commission to identify possible competition concerns affecting European e-commerce markets.⁹ While making this issue a priority may appear to be a good policy choice, interpreting the single market objective as a way to eliminate all price discrimination practices is likely too narrow an approach and not based on solid economic principles - part of the issue here is that the economic analysis does not always offer clear predictions about the welfare effects of price discrimination. If the single market objective is understood to mean uniform prices across all EU areas that would be an extreme view; after all, prices are not the same even within the same country. Prohibiting price discrimination may not lead to everyone having access to the goods or services at the lower possible price, which is often implicitly assumed. Instead it is possible that it may lead to some markets not being served at all, which would be contrary to the single market objective.

Overall, while in this survey we are motivated by some important recent cases and emphasize some new aspects of how markets work and the need for new research, we also stress the *continuity* that should exist both in the economics analysis and in competition policy: when moving forward to applications in new markets, ignoring past results is not an appropriate way to proceed. Many of the issues that surface as important in digital markets are not really new or absent in other markets and therefore (should) have been also studied otherwise in some way. However, the difference in scale is often so large that from a practical viewpoint the priorities for what really matters, the nature of how the market forces interact and the application of policy analysis is often as if we are facing a completely different market environment. The challenge there would be, for each case, to try to disentangle what are the new elements that play the key role. Online travel agencies for example make searching for a hotel reservation in London a much different activity for a Brussels resident than it used to be. However, we could in principle have had (and we did have) travel agents before the Internet time and also we could have (and we sometimes still have) online search without online platforms to act as intermediaries.

So it appears that it would not be a fruitful or efficient way to proceed to argue that the new markets require a whole new set of research that would make the existing one obsolete. Instead the key is how to use existing results, refine, extend and enrich them in the context of

⁸ See http://ec.europa.eu/priorities/digital-single-market/index_en.htm

⁹ Some first results would be expected in 2016 - http://europa.eu/rapid/press-release_IP-15-4921_en.htm

the digital markets. In particular, there are at least two important literatures within IO that are relevant here and by their nature necessarily closely related to the currently open issues. These refer to the study of vertical relations (integration and vertical 'restraints') and to pricing practices: in particular, price discrimination and non-linear pricing. We outline the very important recent progress that has been made in each of these areas, but also identify areas that are still not fully explored and are still both open and important.

The challenges faced by researchers in each of these areas are not trivial. The study of vertical relations necessarily finds in its way the issue of bargaining and of the distribution of power across vertically-linked firms. Such firms act both as collaborators, since they trade goods and services with each other, and at the same time competitors since they compete in sharing the joint surplus, a feature which makes the problem inherently difficult to analyze. Relating these ideas to policy, the 2010 EU Guidelines on Vertical Restraints is a rich and relevant document that may suggest areas where some more clarity based on academic research is needed. One area of importance, for both research and competition policy practice, is the more detailed definition of online sales and study of the phenomenon. Treating all online sales as 'passive' sales, and with restrictions on these not being allowed, the assessment of practically any restriction of cross-border online sales has to take a predetermined direction which may not be necessarily correct. Resale Price Maintenance (RPM) is also an important topic for further research, with part of the relevant economics approaches not being always aligned with the direction of the Guidelines or with some recent policy practice. Naturally, especially with the joint presence of both online and offline sales, when competition is examined, it is also important to examine the relevant investment incentives by the suppliers, since quality improvement may often be at least as important an issue as pricing.

Pricing itself has been naturally a core issue in economics. However, we may not have yet a complete understanding of how pricing functions when there is price discrimination and various types of non-linear pricing under oligopoly competition, when there are vertical relations, or what are the welfare implications of the various related restrictions, especially when we have important dynamic effects. Overall, a key challenge is how to determine the welfare effects of (direct or indirect) price discrimination, or of price restrictions, especially in rich environments where the technology significantly facilitates the identification of buyers or groups of buyers by (some of) the sellers and where the technology may make possible, and often very inexpensive or automatic, various price comparison practices (e.g. through websites). The matter is obviously complex and, not surprisingly, the current literature is not conclusive. This is true in the area of theory research but also in empirical work, where (partly due to the heavy restrictions because of the lack of high quality data) more work would be important, especially using data from European markets. Links to other areas, notably behavioural approaches, may

also prove useful especially when referring to buyers that may understand their environment much less than the pricing agents.

It is beyond the scope of this survey to examine in detail the important related competition cases that have been recently examined or are under examination. Instead, the focus is on the relevant economics literature, though due to space limitations the coverage will be very partial. We try to outline what it is that we know from the body of the past and current related literature. Also what are the areas and topics where further research is needed and possibly can be important for policy in the real economy. This refers both to more basic research (that could be useful across a number of competition policy and other issues) and to research that is motivated by specific competition cases. Progress in these areas in the near future should be a priority, since it can lead to a significant improvement of our understanding of how markets work and of the most appropriate ways that policy can handle any market imperfections.

The remainder of this survey article is organized as follows. The next chapter gives a general perspective on competition policy in the EU, before turning to some recent developments there. We attempt to organize digital markets according to what are the main features of the goods supplied, since the digital nature of each market does not have to operate in the same way as in another. Then we sketch some specific cases (including e-books and online travel agencies) that can serve as some leading examples for the analysis and comment on the EC Single Digital Markets initiative. We close this chapter by turning to an outline of the relation between online and offline trade from the perspective of economics. Chapter 3 then identifies and discusses the main challenges that economics research is facing when analyzing and supporting competition policy in digital markets. Chapter 4 examines some of the established results from the relevant IO literature, looking first at pricing (with focus on price discrimination) and then to vertical relations (with a focus on ‘restraints’). Chapter 5 then turns to research that is motivated specifically by the important recent and current competition issues: how to treat online and offline sales, geographical and other pricing restrictions, parallel trade and Most Favored Nation clauses (including ‘business MFNs’). It also makes a reference to some other related ideas, including behavioral approaches to market analysis and the role of personal data for price discrimination in relation to privacy issues. Section 6 concludes.

2. A view on competition policy in Europe

2.1 Competition policy: the general context

As mentioned in the Introduction, policy at the EU level has made the more efficient functioning of product markets a clear priority. Policy activity is being organized around four

areas, collusion and cartels, abuse of dominance, merger control and state aid. Activity has been high in each of these areas, as is also manifested by many high profile cases examined and by the increasing level of fines imposed. In terms of the foundations for the activity in competition policy, significant progress has been made in the last decade in Europe in a number of important fronts. The challenges, however, have been nontrivial.

One key central issue has been the tension between an economic-based and a more formalistic approach in policy, a distinction that often expresses itself as a choice between a more effects-based and a *per se* approach to competition cases. While there has been some increased clarity in this front, the matter is not 'resolved' and will likely remain a core element of the debate about competition policy for the decades to come. With the goal to make progress in this front, Industrial Organization economists have studied systematically topics directly or indirectly related to competition policy, while at the same time policy makers have often appeared open to receiving guidance for their decisions by economic analysis.¹⁰ An area where economic analysis has contributed significantly in the last years in European policy making is in identifying economic *efficiencies* and the related tradeoffs of policy actions. This was primarily effective in the areas of vertical relations and mergers and in state aid. However, certainly not everyone agrees about how important the progress made by economics analysis has been, or even how important a role economics can play in competition policy decisions.¹¹

A second important area where progress has been made is in defining the limits of the application of competition policy. One issue here is the relation between the application of competition policy principles (which typically refer to ad hoc and ex ante interventions) and sectoral regulation (which typically aims to establish economic efficiency by ex ante and often comprehensive interventions). Where should one draw the line between the two and how one can facilitate the transition from a more regulation-based to a more 'free-market' functioning,

¹⁰ See Motta (2004) for an overview that connects the policy and the economic analysis sides of this relation.

¹¹ A case to be certainly noted is *Intel* which has been considered as a critical test for the EC effects-based approach in abuse of dominance cases, as set out in its 2009 Guidelines. This approach was in contrast to the prior case law which was form-based and leaving little room for an analysis of the competitive nature of potentially exclusionary conduct. In a key recent (June 2014) General Court judgment, the EC 2009 *Intel* decision has been confirmed. In particular, the 2009 decision had found the computer-chip producer to infringe competition rules by granting anti-competitive rebates to computer manufacturers in an attempt to exclude its rival AMD from the market. The General Court's *Intel* judgment holds that the Commission rightly found that the chip producer breached competition rules. Importantly, however, the judgment also notes that the effects-based analysis was redundant given the particular form of rebates used. Thus, from a policy perspective, the Court re-asserts the form-based standard and finds that effects-based analysis is largely unnecessary for these types of rebates. See http://europa.eu/rapid/press-release_MEMO-14-416_en.htm

that is without systematic regulation but with an application of competition law when this is needed. This question is central in many markets including telecoms, energy, transport and banking and of course affects the relation between DG-Competition and the other Directorates in the European Commission (EC). A related important challenge has been the gradual harmonization of policy and clarification of jurisdiction between countries, especially with the U.S. and also within the EU.

A third challenge has been to clarify the relation between competition policy and other policy areas. In the areas related to innovation policy, such as in the intellectual property protection front the central question is to understand how static efficiency (where high profit is often a measure of market inefficiency) and dynamic efficiency (where it is the prospect of profit that typically drives innovation) are related. Related key challenges have been presented by the recent financial and macroeconomic crisis. Should one think differently about the application of competition law – especially in the areas of merger control and state aid – when key firms (including financial) or even entire sectors face distress, or is the importance of the rules exactly to offer guidance at the more difficult times, even if this means that a significant part of economic activity will be eliminated?

Overall, and looking across the four core areas (cartels, abuse of dominance, mergers and state aid), the amount of work that has been put in place in the EU over the recent years has been quite significant, although the issues described above are probably too deep and complex to be fully resolved. A very useful summary of the economic analysis used in DG-Comp in the recent years, including both cases based on some innovative economic analysis and new issues, can be found in a sequence of articles: Neven and Albæk (2007), Neven and de la Mano (2009). Neven and de la Mano (2010). Kühn *et al.* (2011), Kühn *et al.* (2012), Buettner *et al.* (2013) and Buehler *et al.* (2014).¹²

2.2 Digital trade and online markets

While it is now commonplace for economists and business people to concern themselves with the new issues that the new digital economy brings, it is important to try to think in some more structured way about what the term digital markets really means and what is really fundamentally new there (if anything) and in online trade (or electronic-trade, e-trade). One way to approach and organize the various aspects of the issue is as follows.

¹² There is now a number of high quality competition policy textbooks and handbooks, see e.g. Buccirossi (2008).

- A. A first category includes situations where *the Internet is used for the end user to have access to a good that is being offered (online) in digital form*. This includes movies, music, news, e-books, scientific articles, and various other types of goods that the consumers will be able to see or listen and would typically have informational or entertainment value. The user goes online and obtains access. Some important remarks for this case:
- i. The goods in this category could normally also be supplied in some other form, through some alternative means. First, access to them in digital form could be made without the Internet (i.e. by using a CD, DVD or some other such medium). Second they could be used in a non digital form, but in other traditional ways: *Casablanca* was being watched by large audiences years before the digital format became possible; the *New York Times* was published only in paper format for decades and so did the *Review of Economic Studies*; *Mozart's* symphonies were composed and listened to without anticipating a digital format would ever become the standard and the same holds for the publication of *Moby Dick*. In many cases the two channels, digital and traditional, coexist in the market either supplementing each other or competing.
 - ii. Users of these goods obtain access to them typically by paying directly online and this payment could take the form of either paying for each item or usage separately, or by purchasing a subscription. Some other times the ends user could have access to the good without making any payment and the supplier benefits indirectly, in the context of a two-sided market.
 - iii. How convenient and secure is the payment can be crucial for the efficient operation of such markets. Therefore the development of electronic payments systems is complementary to such markets.
- B. A second category involves markets where the end good that will be consumed is *not* in digital form and instead the online operation merely facilitates search and purchasing. In cases such as searching or booking for hotel stays, travel, car rentals, housing, clothes or theaters, the Internet can be used either for providing information about the good (directly from the supplier or indirectly through other sources) or by proceeding to a booking and possibly payment. The actual consumption in all of these cases is not made online but in the 'real' world. In this sense digital markets can affect literally any other markets and they are offering a complementary good, the facilitation of the contact between the supplier and the potential buyer.
- B1. One possibility in this case is that we could only have online search for comparison purposes, without completing the actual transaction. The search would typically be

about information for the goods' characteristics and prices. It may include access to information that is not only provided by the supplier, but also by past users or by experts. For the search to be more useful, at some level some comparison should be possible between alternative purchases and substitute goods.

B2. Another possibility is that, in addition to the informational content provided, a booking, or a full purchase is made online. In this case and depending on the physical nature of the good, the actual consumption will then take place either with the end user traveling to it (visit a hotel or a theatre) or with the final good being transferred to the user (e.g. clothes shipped at home). Some comments for this case follow:

- i. It may make sense that the sale is made online through a website that is operated exclusively by the supplier. In the same way that the selling company could have a traditional brick-and-mortar store, it may (also) have an online store.
- ii. It may also make sense that the online sale is made through a platform which allows the comparison and sale of goods offered by several competing brands and items. In this case, the platform plays the role of an intermediary, a type of an 'online shopping mall'. The platform acts as a agent for the various suppliers and would typically charge a fee for the service. The delivery of the actual good could be the responsibility of either the platform (e.g. Amazon shipping a book) or the supplier (a hotel providing hotel services purchased through booking.com).

C. A third category may involve digital markets only at the wholesale level, that is, B2B. These may take various forms (e.g. they may be exclusive, or open, with or without paying a subscription fee) and their goal is to facilitate trade between businesses, such as suppliers and distributors. It should be noted that many of these markets do not employ the Internet but other internal electronic systems and also that they existed independently and before the explosion of online trade at the retail level.

D. Online auctions (at a retail or wholesale level) are also a distinct category. It should be noted that auctions, even when organized offline, are market activities that operate on the basis of some clear and precise rules, and their conduct online provides some gains in terms of lower transaction costs. However the changes that are being introduced relative to the traditional format are in general less important than in other markets, where the rules are initially less formal in the traditional format.

- E. Given the above categorization and characteristics, it would be useful to make some initial remarks. Of course, we return to this matter in more detail in the subsequent analysis.
- i. A key feature of digital markets is the much lower search and transaction costs, relative to how these markets tend to operate offline.
 - ii. At the same time, suppliers and intermediaries have much easier access to potential buyers than before and also to key data about their characteristics.
 - iii. The determination of pricing involves many players and issues related to vertical restraints and price discrimination become central. In many cases we tend to have two-sided market features.
 - iv. Whether content is sold online, or the online nature simply is confined in facilitating the trade, intellectual property issues become very important and an analysis of the effects of patents and copyrights may be necessary. This feature becomes even more important because of the cost structure, which is tilted heavily towards the fixed components and not the marginal.
 - v. Who controls pricing and access to the means via which trade takes place is important, including the question of net-neutrality and related issues of pricing internet access.

The particular type of concern that competition authorities have expressed in recent cases in this broad digital context varies. For example in the electronic-books markets (e.g. Apple, Amazon), the main concern is about the general format in which pricing takes place (e.g. wholesale pricing vs. agency); in the online travel agency cases (e.g. HRS) the concern has been about 'best price' (or MFN) clauses in contracts between the platform and the hotels. In distribution cases (e.g. Adidas or Asics) the main concern is if it could make economic sense for a supplier not to allow some broader platform to offer their products. We turn next to a description of some recent important cases in some detail.

2.3 Some recent developments and cases

A number of high-profile and interesting competition cases have been recently examined or are currently open in Europe and are related, one way or another, to online trade and similar issues. While naturally the details in each case are different, online pricing and online access to the customers raise issues of possible abuse of a firm's dominant position: a theme that emerges often is that of pricing restrictions that tend to exclude some suppliers or distributors, or tend to discriminate among categories of buyers.

2.3.1 MasterCard – cross-border rules and inter-regional interchange fees

In July 2015 the EC sent a Statement of Objections to MasterCard, which outlines the view that MasterCard's rules prevent banks from offering lower interchange fees to retailers based in other member states, where interchange fees may be higher. This follows a series of important previous actions on interchange fees, while there is also an ongoing investigation into Visa Inc.'s inter-regional interchange fees policy.¹³

According to the preliminary view of the EC, retailers cannot benefit from lower fees in other areas and cross-border competition between banks may be restricted. It is also stated that MasterCard's interchange fees for transactions in the EU using MasterCard cards issued in other regions of the world (e.g. in the U.S, or Russia) breach European antitrust rules by setting an artificially high minimum price for processing these transactions. It is further explained that payments by card play a key role in the Single Market, both for domestic purchases and for purchases across borders, or over the Internet. Banks use MasterCard to set on their behalf the interchange fees that apply between them. The Commission takes the preliminary view that the practices outlined violate Article 101 of the Treaty on the Functioning of the European Union (TFEU) that prohibits cartels and other anticompetitive business practices.

Two interrelated concerns have been raised in the statement. First, interchange fees vary considerably from a Member State to another. MasterCard's rules prevent retailers in a high-interchange fee country from benefitting from lower interchange fees offered by an acquiring bank located in another Member State. The EC is concerned that MasterCard's rules on cross-border acquiring limit banks' possibilities to compete cross-border on price for services to receive card payments. A second concern is about the high levels of MasterCard's "inter-regional interchange fees." These fees are paid by an acquiring bank for transactions made in the EU with cards issued in other regions of the world. High inter-regional fees may increase prices for retailers and may in turn lead to higher prices for products and services for all consumers, according to the EC.

This case follows recent important developments in the markets for digital payments and, in particular, regarding how market competition is related to the appropriate regulation of interchange fees.¹⁴ The more controversial part of the new case may be that, under the current practice, banks in one EU member state are prevented from offering lower interchange fees to a retailer in another EU country where interchange fees may be higher. If this practice is found

¹³ See http://europa.eu/rapid/press-release_IP-15-5323_en.htm

¹⁴ In September 2014, the European Court of Justice upheld a 2007 decision by the EC that MasterCard's multilateral interchange fees on cross-border transactions breached competition rules. Overall, through a sequence of decisions, caps have been placed in EU member states to interchange fees of 0.3% of the value of credit-card transactions and 0.2% for debit-card transactions.

to violate the law, a move towards high concentration is expected to be observed. In particular, banks from all member states may move towards acquirers in other member states where because of their currently larger size fees are set at lower rates (and below the regulatory cap). This possibility generates an interesting tension for policy makers. On the one hand, the single market initiative should allow any agent to have access to lower prices at any level and available anywhere in the EU. On the other hand, in a market where high volume plays a crucial role, and small players may find it impossible to survive, removing all barriers may lead to greatly increased concentration and ultimately to lower welfare, at least for consumers in some member states.

2.3.2 Amazon – e-books

In June 2015 the EC opened an investigation into Amazon's electronic book contracts with publishers in the EU. According to the formal announcement the main concern is about clauses requiring publishers to inform Amazon of terms with its competitors that may be favorable, known as "most favored nation" (MFN) clauses. The view of the EC is that the use of such clauses may make it more difficult for other e-book distributors to compete with Amazon by developing new and innovative products and services.¹⁵

It is stated that certain clauses included in Amazon's contracts with publishers concerning such e-books could constitute a breach of EU antitrust rules that prohibit the abuse of a dominant market position and restrictive business practices. In particular, the investigation is focused on clauses which may shield Amazon from competition from other e-book distributors, such as clauses granting it the right to be informed of more favourable or alternative terms offered to its competitors or the right to terms and conditions at least as good as those offered to its competitors.

MFN clauses were at the center of the antitrust ruling against Apple and five major U.S. publishers in 2013. Apple settled a big e-book antitrust case in the U.S. that was driven in part by Amazon's complaints over Apple's deals with publishers. In December 2011 the EC had also opened proceedings in the sector because it had concerns that Apple and five international publishing houses (Penguin Random House, Hachette Livres, Simon & Schuster, HarperCollins and Georg von Holtzbrinck Verlagsgruppe) may have colluded to limit price competition at the retail level for e-books. In December 2012 and July 2013, respectively, the companies offered a number of commitments, to make some changes to their contracts with Apple, which addressed the Commission's concerns.

¹⁵ See http://europa.eu/rapid/press-release_IP-15-5166_en.htm

Overall, the significant increase in e-book reading in Europe has drawn the attention of the EC. The new case will focus mainly on the largest markets for books, in English and German.

2.3.3 Cross-border provision of pay-TV services

In July 2015 the EC sent a Statement of Objections to Sky UK and six major U.S. film studios (Disney, NBC Universal, Paramount Pictures, Sony, Twentieth Century Fox and Warner Bros). The Commission's preliminary view is that each of the studios and Sky UK have bilaterally agreed to put in place contractual restrictions that prevent Sky UK from allowing EU consumers located elsewhere to access, via satellite or online, pay-TV services available in the UK and Ireland. Without these restrictions, Sky UK would be free to decide on commercial grounds whether to sell its pay-TV services to such consumers requesting access to its services, taking into account the regulatory framework including, as regards online pay-TV services, the relevant national copyright laws.¹⁶

U.S. film studios tend to license audio-visual content to a single pay-TV broadcaster in each Member State (or combined for a few Member States with a common language). The investigation identified clauses in licensing agreements between the six film studios and Sky UK which require Sky UK to block access to films through its online pay-TV services ('geo-blocking') or through its satellite pay-TV services to consumers outside its licensed territory. Such clauses may restrict Sky UK's ability to accept unsolicited requests for its pay-TV services from consumers located abroad, i.e. from consumers located in Member States where Sky UK is not actively promoting or advertising its services ('passive sales'). Some agreements also contain clauses requiring studios to ensure that, in their licensing agreements with broadcasters other than Sky UK, these broadcasters are prevented from making their pay-TV services available in the UK and Ireland. As a result, these clauses grant 'absolute territorial exclusivity' to Sky UK and/or other broadcasters. They eliminate cross-border competition between pay-TV broadcasters and partition the internal market along national borders.

In related cases the EC investigates licensing agreements between the film studios and other major European broadcasters (Canal Plus of France, Sky Italia of Italy, Sky Deutschland of Germany and DTS of Spain). These investigations are ongoing. In its October 2011 ruling on the Premier League/Murphy cases, the EU Court of Justice addressed the issue of absolute territorial restrictions in licence agreements for broadcasting services. The Court held that certain licensing provisions preventing a satellite broadcaster from providing its broadcasts to

¹⁶ http://europa.eu/rapid/press-release_IP-15-5432_en.htm

consumers outside the licensed territory enable each broadcaster to be granted absolute territorial exclusivity in the area covered by the license, thus eliminating all competition between broadcasters and partitioning the market in accordance with national borders.

In the case under examination, broadcasters also have to take into account the applicable regulatory framework beyond EU competition law when considering sales to consumers located elsewhere. This includes, for online pay-TV services, relevant national copyright laws, a matter related to EC's proposal to modernise EU copyright rules, as part of its Digital Single Market Strategy.

2.3.4 Google – online comparison shopping

In April 2015 the EC sent a Statement of Objections to Google concerning its comparison shopping service. The allegation is that the company is abusing its dominant position in the markets for general internet search services by systematically favouring its own comparison shopping product in its general search results pages. The view expressed is that such conduct infringes EU antitrust rules, because it stifles competition and harms consumers.

According to the EC, comparison shopping products allow consumers to search for products on online shopping websites and compare prices between different vendors. The preliminary conclusion of the Commission is that Google gives systematic favourable treatment to its own product 'Google Shopping', e.g. by showing Google Shopping more prominently on the screen. It may therefore artificially divert traffic from rival comparison shopping services and hinder their ability to compete on the market. The Commission is concerned that users do not necessarily see the most relevant results in response to queries - this is to the detriment of consumers, and stifles innovation. Further the Commission's preliminary view is that to remedy such conduct, Google should treat its own comparison shopping service and those of rivals in the same way.

2.3.5 Online marketplaces and selective distribution

Some important cases in Germany, in July 2014 considered the terms of distribution via online marketplaces. The German Federal Cartel Office (*Bundeskartellamt*, or BKartA) and the Schleswig Court of Appeals (*Oberlandesgericht*, or OLG Schleswig) have held that Adidas, ASICS and Casio must allow their approved resellers to use internet auction sites and online marketplaces to resell their goods. These cases suggest that a supplier may not prohibit, but merely regulate, such online resale by way of a selective distribution system in which

requirements and restrictions on online sales do not exceed similar obligations imposed on resellers for other, namely offline, distribution channels.

These cases, as well as the ruling of the Berlin Court of Appeal (“Kammergericht”, KG) in 2013, on Scout satchels (Case 2 U 8/09 Kart), suggest that a supplier may only restrict the use of internet platforms and market places in a selective distribution system in which the criteria imposed on online sales are at least overall equivalent to criteria imposed for other sales channels, e. g. sale in physical shops, as explained in the Guidelines of the European Commission on vertical restraints.

In a statement relating to the Adidas case, BKartA took the view *“that the trading possibilities offered by the Internet create new challenges for both manufacturers and retailers”* and that it is its *“task to keep markets and opportunities open for the benefit of retailers and consumers”*. The statement continues, *“It goes without saying that manufacturers can select their distributors according to certain quality requirements. However, both under European and German competition law they are prohibited from largely eliminating a principal distribution channel such as the web.”*

2.3.6 Online travel agencies and MFNs

In a series of cases across Europe, competition authorities have looked at MFN clauses and other pricing restrictions in relation to the operation of online travel agencies.

In January 2015, the Düsseldorf Higher Regional Court rejected the appeal of Robert Ragge GmbH's Hotel Reservation Service (HRS) against the decision of the Federal Cartel Office (Bundeskartellamt) of December 2013. In its decision the authority had prohibited HRS from continuing to apply its ‘best price’ clause and at the same time initiated proceedings against the hotel booking portals Booking and Expedia for applying similar clauses in their contracts with their hotel partners. Under the ‘best price’ clauses the hotels are obliged to always offer the hotel portal their lowest room prices, maximum room capacity and most favourable booking and cancellation conditions available on the Internet.

The Düsseldorf Higher Regional Court decision has confirmed that HRS's ‘best price’ clauses restrict competition to such a degree that they cannot be exempted under the TFEU Block Exemption Regulation, or as an individual exemption. The Federal Cartel Office originally issued a statement of objections against HRS in early 2012 focusing on the company’s policy which bans hotels from offering better deals to customers who book directly through the hotel or through another booking platform. The concern was that, while the clauses used (also by other

travel websites), may appear to benefit consumers, in reality they may eliminate competition for lower room prices between the hotel booking portals. Consumers are worse off because they cannot get a better price or better quality service conditions by exploring alternative reservation paths.¹⁷

Many other competition authorities in Europe have also recently conducted similar investigations against hotel booking platforms in relation to their 'best price' clauses. These include the U.K.'s Office of Fair Trading case against Expedia Inc. and Booking.com in coordination with InterContinental Hotels Group PLC and the Swiss Competition Commission's case against several online travel agencies, including Booking.com, Expedia and HRS.¹⁸

How competition policy should treat the employment of MFN clauses (by online platforms or otherwise) is not a simple matter and how economics analysis can help the formulation of policy will be discussed in subsequent parts of the survey. Many interesting applied policy analyses have also appeared; e.g. P. Akman in a July 2015 article considers the acceptance of commitments offered by Booking.com to the French, Swedish and Italian competition authorities.¹⁹ She argues that these commitments may represent at best an ineffectual solution to any problem existing on the relevant market.²⁰ Booking.com has agreed not to use the 'broad' MFC clauses in its contracts with its hotel partners for a period of five years, from 1 July

¹⁷ According to a statement in 2013 by FCO President Andreas Mundt, "Such clauses make the market entry of new suppliers offering innovative services, such as last-minute offers via smartphone, considerably more difficult, as these new competitors are not able to offer hotel rooms at better rates." "The competition between the hotels is also hindered because they are not free to set their prices independently and cannot respond flexibly to new competition developments."

¹⁸ Booking.com is currently the largest online hotel agency in the world. Expedia Inc., including Expedia.com, Hotels.com and Venere, ranks second. HRS is a Germany-based travel agency.

¹⁹ The French, the Italian and the Swedish Competition Authority coordinated their investigations and on 21 April 2015 adopted parallel decisions accepting identical commitments from the market-leading online travel agent Booking.com and making them binding in their respective jurisdictions. The EC assisted the authorities in coordinating their work. In the course of the investigations, Booking.com conducted a customer survey of 14000 consumers in 9 Member States and produced economic papers to argue that parity between room prices in hotels' own sales channels and prices offered on Booking.com's platform is important in preventing free-riding on Booking.com's investments and ensuring the continued supply of search and comparison services free of charge to consumers. The adopted commitments prevent Booking.com from requiring hotels to offer better or equal room prices via Booking.com than they do via competing online travel agents. In addition, Booking.com cannot prevent hotels from offering discounted room prices provided that these are not marketed or made available to the general public online. The discounted prices can be offered online to members of a hotel's loyalty scheme or via offline channels.

²⁰ See 'Are the European Competition Authorities making a less anticompetitive market more anticompetitive? The Booking.com saga,' Competition Policy Centre, University of East Anglia, *Competition Policy Blog*, July 8, 2015.

2015. As a result Booking.com can no longer require the hotels to offer Booking.com the best price across platforms or the best price that the hotel charges through its offline channels. Yet, the commitments do not stop Booking.com from imposing MFN clauses to the extent that the clause seeks parity between the prices on Booking.com and the prices on the hotel's online channels such as the hotel's own website. This commitment is different from the infringement decision taken by the Bundeskartellamt in the *HRS* case and do not prevent Booking.com from seeking parity between prices on Booking.com and the hotel's online channels, whereas the Bundeskartellamt's infringement decision prohibited all types of MFN clauses.

2.3.7 Resale price maintenance cases

Resale price maintenance (RPM) is a common vertical restraint which has received much attention in competition policy. Recently there have been a large number of cases examined by NCAs, typically taking the view that minimum RPM, since it is a restraint, violates the law. Yet, the economics literature has concluded that there are both anti-competitive and pro-competitive effects from the use of RPM.²¹ On the one hand, a possible anti-competitive effect could be related to the solution of the 'commitment problem' of a monopolist, which would impede even a monopolistic supplier from enjoying full monopoly profits, because this supplier would have the temptation to reduce the wholesale price set to one distributor to allow that distributor to expand its market share, even when this hurts rival distributors. A market-wide RPM, if credible to all parties, could solve this problem because it could prevent the opportunistic behaviour on the part of the supplier. RPM may also soften competition when two or more suppliers sell their products to two or more distributors ('interlocking relationships'). RPM might also facilitate collusion, either among suppliers or among distributors. In particular, collusion among suppliers may be easier to achieve because RPM can help offer a superior monitoring of deviations from the collusive agreement. On the other hand, however, there may be very important pro-competitive effects, since RPM may help protect necessary 'specific investments' by preventing opportunistic or free-riding behaviour among distributors. It may also help with signalling the quality of products, or help establish a price reputation and the overall brand image for the supplier's product.

The publication of the Commission Regulation No 2790/1999, on the application of Article 81(3) of the Treaty to certain categories of vertical agreements and concerted practices²², was an important development in the area of vertical relations. This 'Block Exemption Regulation' (BER) was intended to provide a 'safe harbour' to firms with less than a 30% market share and

²¹ See e.g. the analysis in the EAGCP report by Motta *et al.* (2010) prepared in the context of the revision of the verticals BER.

²² Official Journal L 336, 29.12.1999, p. 21-25

was accompanied by the relevant Guidelines on Vertical Restraints.²³ The BER was viewed as the first of a new generation of block exemption regulations and guidelines, inspired by an 'effects-based' approach, where economic analysis should play an important role and it has been followed by similar reforms in other areas of competition policy. The core of this approach is that, in order to reach an assessment about a given vertical agreement, the precise potential effects of the agreement on the market should be analysed, thus moving away from the old formalistic approach. The 1999 BER established that article 81(1) (now article 101 TFEU) did not apply to vertical agreements in which the supplier does not hold more than 30% market share, since vertical agreements are likely to harm welfare only if the firms using them possess substantial market power. In addition, in its Article 4, it also stated that the exemption should not apply to some vertical agreements that the Commission considered harmful. These 'black-listed' or 'hardcore' clauses include in particular RPM (more precisely resale price fixing and minimum resale price) and vertical clauses which aim at restricting 'active' sales from one territory to the other.²⁴

Like in its old version, the revised BER still contains a list of restrictions that are 'black-listed' including RPM and other (that is, non price) resale restrictions. The view is still taken that there should be a presumption in the EC law that they should be prohibited. Specifically, according to Paragraph 47 of the Guidelines, if an agreement contains a 'black listed' restriction, the agreement presumptively falls within the scope of prohibited agreements under Article 101(1) as having actual or likely negative effects, and it presumptively does not satisfy the justification standards of Article 101(3). The implication is that once a hardcore restriction is established, the agreement is presumptively both anticompetitive and unjustifiable. Still, it is recognized that this double presumption is rebuttable and the parties can bring forward evidence that the positive effects of the agreement under examination outweigh the presumed negative effects. Regarding minimum price and fixed price RPM, in particular, the Guidelines offer a detailed exposition about evidence that could be put forward in RPM cases.²⁵ However, a restriction on

²³ Official Journal C 291, 13.10.2000, p. 1-44

²⁴ Vertical agreements containing such hardcore restrictions were not exempted from the application of Article 81(1), even if the firms concerned had an arbitrarily small market share, since the *de minimis* Notice (2001/C 368/07) does not apply to such hardcore restrictions. According to the Guidelines, paragraph 46, "Individual exemption of vertical agreements containing such hardcore restrictions is also unlikely", thus implying a regime which is in practice very close to *per se* prohibition for these black-listed restrictions.

²⁵ Paragraph 224 of the Guidelines describes various possible ways in which RPM may restrict competition, while Paragraph 225 states that justifications will be considered and that the possible efficiencies will be assessed under Article 101(3). Similar to RPM, regarding Resale Restrictions, the BER generally does not cover agreements that restrict the buyer's ability to sell in some territories or to some consumers the goods or services that the agreement refers to. However, there are a number of

passive sales (responding to ‘unsolicited’ requests from customers outside the specified territory or consumer group) would be considered a hard-core restriction. Regarding selective distribution, the BER allows suppliers to have a selective distribution system, where distributors are selected according to some specified criteria.²⁶ On the basis of academic research, many economists would not necessarily agree with the approach taken by the EC Guidelines regarding the treatment of RPM and would favour a less formalistic approach.

Against the above described background, the recent activity at the policy level is of interest. In a series of cases, some NCAs find that fixed price or minimum RPM directly violates the law, even if the markets shares of the related firms are very small, paying close attention to contractual freedom. In other cases, NCAs have recently taken a different route.

In October 2014, the Swedish Competition Authority (SCA) adopted a reasoned priority decision not to pursue the investigation of a complaint regarding RPM.²⁷ The preliminary investigation indicated that 13:e Protein Import AB had a low market share, below 3%, in the upstream market for the manufacture of protein powder products. Based on the findings of the preliminary investigation, this market is the narrowest relevant market that could potentially be defined. Furthermore, the findings of the SCA indicated that both the upstream and downstream markets for protein powder products were highly fragmented. “Upstream, there were a large number of actors and there seemed to be no significant barriers to entry. Downstream, the products were sold through many sales channels. There were no indications that other market participants were engaged in resale price maintenance”. Based on these facts, the SCA concluded that the case did not merit prioritization.

In April 2015 the Dutch Competition Authority published a paper setting out its strategy and enforcement priorities relating to vertical agreements. It confirms ACM’s lenient economic approach towards vertical restraints and assumes that vertical restraints are generally pro-

important exceptions, where such restrictions are not considered hard-core, with the most important ones being systems of ‘exclusive distribution’ and ‘selective distribution’.

²⁶ The revised BER pays particular attention to the matter of online (Internet) sales, since the Resale Restrictions rules apply to both online and (traditional) store sales. Once distributors have been authorised, they must be free to sell on their websites as they do in their traditional shops and physical points of sale. For selective distribution, this means that manufacturers cannot limit the quantities sold over the Internet or charge higher prices for products to be sold online.

²⁷ The case concerned the market for the manufacture and sale of sports nutrition products such as protein and carbohydrate-based products and other performance enhancing products. The SCA was informed that 13:e Protein Import AB, a manufacturer of sports nutrition products under the brand "SELF Omninutrition", had sent a minimum resale price list for protein powder products to its online buyers, asking them not to adopt prices below the prices on the price list.

competitive in the absence of market power. This claim includes typical hard-core restraints such as resale price maintenance (RPM).²⁸

2.4 The Digital Single Market and Sector Inquiry

Partly motivated by some high profile cases including some of those highlighted in the subsection just above, the EC considers that too many barriers still block the flow of online services and entertainment across national borders. The Digital Agenda is set to update the EU Single Market rules for the digital era. Creating a Digital Single Market is stated as one of the priorities of the EC President Juncker. The aims are to boost the music download business, establish a single area for online payments, and further protect EU consumers in cyberspace.²⁹

According to the EC, its Digital Agenda forms one of the seven pillars of the Europe 2020 Strategy which sets objectives for the growth of the European Union (EU) by 2020. The Digital Agenda proposes to better exploit the potential of Information and Communication Technologies (ICTs) in order to foster innovation, economic growth and progress. The Digital Agenda's main objective is to develop a digital single market in order to generate smart, sustainable and inclusive growth in Europe, and it is made up of seven pillars.

A key consideration towards achieving the digital single market goal is that Internet access should not 'stop' at Member States borders. Instead it becomes a goal that as consumers we should 'benefit from the best content, deals and services, wherever we are in the EU, without being geo-blocked. Businesses should be able to market and share their bright ideas across the EU.'

The associated Sector Inquiry that was announced in May 2015 by the EC will help reveal possible problems with competition in the Digital Markets in Europe and where interventions may be warranted at the present or future times. This will be clearly a very important document and it is hoped that it will be guided by sound and state of the art economic analysis. It should be noted however, that the Single Market objective does not always overlap with the application of the competition law, or even that the two always move in the same direction, especially when it comes to promoting uniformity of market outcomes across Member States. We will return to this theme in the subsequent analysis.

²⁸ See <https://www.acm.nl/en/publications/publication/14226/ACMs-strategy-and-enforcement-priorities-with-regard-to-vertical-agreements/>

²⁹ See <https://ec.europa.eu/digital-agenda/en/digital-single-market>

A Study conducted for the DG for Internal Policies, “A Digital Single Market Strategy for Europe,” was published in July 2015. It describes the challenges for competition policy in relation to the digital economy and also some neighboring policy areas such as intellectual property and data protection.

Another useful and relevant policy paper was published by the German Monopolies Commission in June 2015.³⁰ The report puts emphasis on the analysis of markets in which services are provided by multi-sided platforms. This set includes search engines, social networks, and some areas of e-commerce. It takes the view that the multi-sided nature of services and the importance of data must be taken into account to a more significant extent by competition policy. “Special regulation is currently being discussed, primarily with regard to the provision of internet search. Such regulation does not appear necessary from the current perspective. Instead, the Monopolies Commission recommends adjustments to existing competition law. Merger notification thresholds, for instance, should be amended to also capture takeovers where target companies have a comparatively low turnover yet relatively high transaction values. Considering the dynamics of digital markets and the great complexity of potential issues in competition, the Monopolies Commission recommends adjustments to the rules for competition abuse proceedings.”

2.5 The nature of Online vs. Offline competition and distinguishing features of digital markets

While there are certainly differences between how markets operate and should be regulated between the digital world and in the ‘traditional’ or perhaps old-fashioned context, there are also many similarities. After all, markets are markets and traditional economic analysis never claimed that it relied on the assumption that sellers and buyers would all meet at the same physical space. Frictions, search and asymmetries in information have always been part of how economists would analyze a market. So what may be distinguishing features of digital markets? Are there key features that may make our older thinking of how markets work obsolete?

³⁰ Competition policy: The challenge of digital markets, pursuant to Section 44(1)(4) ARC, 1 June 2015. This report follows up on the XXth Biennial Report from 2014, in which the Monopolkommission addressed questions of competition, data and consumer protection in the digital economy.

It would be useful to distinguish some of the key features and by now there have been various approaches. Lieber and Syverson (2012), for example, offer an informative and useful review of the basic facts, as well as related analyses.³¹

- i. The supply of digital products typically involves a specific cost structure: much (often, essentially all) of the cost is fixed while the marginal cost of supply can be trivial (essentially zero).
- ii. When it comes to the production of content (news, scientific, entertainment, etc) this fixed cost is typically sunk. In that sense, copyrights and other forms of intellectual property protection are important for the functioning of many digital markets.
- iii. When selling online non digital products the distribution and storage costs are typically much lower than selling through traditional 'brick-and-mortar' stores.
- iv. Search cost for buyers, at least in reference to prices can be much lower than through in traditional stores where a physical visit would be required.
- v. Distance (and contact only online) makes it difficult for buyers to inspect some product, with respect to some important key characteristics. Therefore asymmetric information may be a key parameter of the problem. High reputation and having the trust of the buyers is essential for the success of any firm selling online, often much more than a firm selling through traditional stores where physical inspection is possible.
- vi. When selling physical goods online (naturally not when selling content, however) delivery will take some time; having a large enough size that allows economies of scale and scope in delivery could be important.
- vii. Online sellers may be able to collect key data for their potential buyers, either simply by tracing their past browsing and purchasing history or by collecting from them additional information. These data may be valuable when designing pricing strategies, in particular, in the context of price discrimination. The data collection and processing may often represent a market in itself.
- viii. Significant privacy issues are raised that may concern online buyers. Data protection is important.
- ix. Services are often provided by multi-sided platforms. Size may play an important role, and often competition for the market(s) maybe more relevant than competition in the market(s).
- x. Online and offline sale activities may be not always substitutes but often complements, for the sellers and/or the buyers.

³¹ See also Smith, Bailey and Brynjolfsson (2000) for an early review and assessment.

In the following analysis we map the key features outlined here with the literature. We first (in the next chapter) turn to the more generic literature, since pricing and vertical relations are core and well studied areas in IO, even if many of their areas are not yet fully explored. This literature is important and relevant, even when not produced only having competition policy in digital markets issues in mind. Subsequently, in Chapter 4, we review literature that has been produced with the specific motivation of understanding aspects of how competition should approach these markets.

3. Challenges for research on competition matters in digital markets

Based on the above analysis, there are novel and specific challenges that research will have to face in its attempt to analyze and support the design of competition policy in digital markets. It may be useful, first, to summarize the key important features of the problem at hand:

- Digital markets tend to be characterized by very strong network effects: platforms provide the basis for aggregating and delivering content and services, acting as intermediaries between providers and end users; the network effects, direct or indirect, will tend to promote high concentration, consumers may be locked-in and first mover advantages may be of critical importance.
- Service providers may have different interrelated routes for delivering digital services, with some key market positions being contestable – one may expect that tipping is possible following some successful innovation.
- Marginal cost of production may be often negligible relative to the fixed cost and scale matters.
- Given the above features, what appears crucial for competition policy is to prevent the creation or reinforcement of entry barriers: it is not actual competition that may matter as much, but making sure the entry is allowed for efficient and innovating new players.
- As a result, the more traditional analysis of competition policy, even proceeding to market definition and measuring market shares may face significant difficulties, as the boundaries are fluid. Of key importance for the competition authorities is to understand the underlying dynamics of the market in terms of technology and strategic incentives.
- Access to end user data is of prime importance since it may greatly facilitate price discrimination and also provision of service according to individual needs. Established, large players in the market will tend to obtain a very significant advantage through the access to such data relative to newcomers. In addition, by proceeding to the combination of user data from multiple platforms, an owner or operator of such multiple platforms will tend to be able to offer a much improved service.

- The much enhanced ability in principle to sell to wider sets of diverse buyers makes price discrimination or blocking access to content or other services, a much bigger matter relative to traditional markets. In particular, such practices which fragment the markets, poses almost by definition challenges to the single market goal. However, neither the literature nor the practice necessarily suggest that imposing price of content uniformity across all areas is necessarily optimal policy either in a static or a dynamic (that is, taking into account the investment incentives) sense. Instead, imposing uniform prices and qualities across otherwise different areas too soon, may prove an obstacle for the market development.

Given these features, suggestions and comments about how research could proceed can be organized around four distinct themes.

First, 'digital' markets may be different but they are still markets and the new problems faced can be found, in one way or the other, even in much lesser extent and less systematically, in other markets. Therefore the stock of knowledge from the existent industrial organization literature is valuable and should not be ignored. While this statement may be obvious, the temptation may emerge to ignore economic analysis altogether and to follow a completely formalistic approach, using the idiosyncracies of these new markets as a pretext.³²

What economics analysis has to offer is primarily the identification of efficiencies that should be considered. Placing the maximization of economic welfare as an anchor it ensures that there is some consistency in legal approaches that may otherwise run the risk of becoming too formalistic and, thus, ineffective. Especially with market shares that may be quite high (even if only temporarily) it may be too easy for competition policy to position itself against pricing and other strategies of large firms that may not be viewed as safe or well-enough understood. Economic results from such areas as pricing analysis and vertical relations could be useful in avoiding such faulty analyses.

Second, while the application of competition policy should be characterized by continuity whenever possible and old results should not be ignored, the co-existence of some systematic characteristics implies that there are some new main challenges that the digital economy poses for competition policy, which at least require a change in focus and priorities. So the production of some fundamental new theory is needed. When network effects and economies of scale or

³² A related misguided approach was used in the 90s, when finance analysts, when evaluating newcomers into internet industries, were claiming that the laws of economics need not apply to the dot.coms, contributing in this way to the creating of a bubble.

scope are very strong, the analysis of equilibrium in markets and of the optimum economic welfare becomes more challenging. 'Standard' economic models often rely on optimization over 'concave sets' or proceed by ruling out local deviations. Under conditions such as the ones that digital technologies may imply, the optimum may in principle involve large market shares by firms, or even 'near monopolies'. This is for two reasons, both so that economies of scale are adequately exploited and as a reward to successful (but costly and risky) innovative activity. In terms of theory, in digital markets we are more likely to see 'competition for the market' (and races where the occasional winner 'takes it all') rather than competition 'in the market'. This feature, in turn, has two implications. First, that in the application of competition policy, more attention should be given to ensure that innovative activity is high and entry barriers (including, of course, those created strategically by rivals) are as low as possible. This is the first order effect, while any other within market conduct effects are of second order. Second, the economic models for analyzing the matter need to be more dynamic. Naturally this comes at a cost. Increased complexity is an important issue, especially when the results and model implications eventually need to be informing legal documents and decisions – a related problem will likely be the lack of robustness. Moreover, in other fields, where dynamic analysis is the norm, like in macroeconomics, it is only rarely the case that analytic model results can be obtained and often the situation is understood through numerical simulations. It is unclear if the economics profession (in terms of publication standards in top journals) and policy makers are currently ready to accept such a shift in modelling approaches.

Nonetheless, the above analysis strongly suggests that we do not currently have the suitable theory background to deeply understand how policy should proceed in markets with many of the features that we encounter in digital markets. The challenge for economic theory is high - perhaps the building of some new 'price theory' is indeed needed to understand how product markets work.³³ The general foundation for economic research in competition policy has been the fundamental price theory analysis in general equilibrium theory and the associated welfare analysis. Under certain conditions regarding technology and consumers' preferences, a competitive equilibrium exists and is efficient. Competition policy starts from this point and attempts to correct or prevent local deviations. In other words, the role of competition policy has been viewed as trying to bring markets as close as possible to the competitive equilibrium benchmark. However, when the fundamentals of markets are very different from the generally accepted assumptions (and this does happen when we have network externalities, extremely increasing returns to scale in production and competition for the market), a competitive equilibrium may not exist or may not be efficient. Thus, the need to fully rethink and

³³ This paragraph expands on ideas that Jacques Crémer presented at the COEURE September 2015 workshop in Brussels. I am grateful for his insights, though responsible for any misinterpretations.

characterize what we consider as the optimum in markets emerges. With the characteristics of digital markets, it is not obvious if the way that markets work fits the standard microeconomic paradigm. It may even be that temporary monopolies, especially when they respond to competition for their markets by other firms who are attempting to replace them, represent the optimal organization in markets. In this light, competition policy has to be extra careful to find some solid ground on which to base its arguments so that it does not risk doing more harm than good.

Third, there are also important implications for empirical current research. Empirical research that can inform competition policy, and such research in Industrial Organization more generally, has been constrained by the limited availability of data. In addition, the particular techniques developed have been also developed partly to respond to this limitation. This is in contrast to other fields, like in financial economics or labor economics where some important data is easier to find. With digital markets becoming the norm this picture may become quite different, since retail transactions may become much easier to record. In principle, a researcher can have access to a wealth of data that do not refer only to the prices and quantities in each market transaction but also key characteristics of the buyers and sellers, like their age, past purchases, or location. As a result, the opportunity arises for new methods to be developed and for a sequence of important empirical papers to be written that would shed significant light on how markets work in practice.

Fourth, with online sales, '*single market*' issues emerge as even more important than before. Online sellers could, in principle, reach buyers across geographical and perhaps language barriers typically, without a significant additional cost. This is a development consistent with the notion of a single market, which is central in EC policies. The idea is to allow buyers and sellers to have market access regardless of their location or other characteristic. However, it is not clear what such a development could imply for pricing and investment incentives. A standard result from economics research is that if a '*single market*' is understood to imply uniform pricing, the implications for the market participants and for welfare will tend to be mixed. Removing the ability to price discriminate from the toolkit of firms, will tend to raise the price for some buyers (or to prevent them from having access at all) and may reduce social welfare, especially if it leads to a reduction in traded volume. This observation is important and very relevant because if the objective of the Digital Single market currently pursued by the EC is viewed as a way to impose price uniformity across all areas and market participants, the implications may not be positive. Further, price discrimination may be a mechanism to ensure the profit level required for the necessary initial investments to be made, thus in its absence a market may not operate efficiently. Some of the competition cases that are currently open in Europe, such as the cross border pay TV cases primarily have such a '*single market*' character.

4. The Industrial Organization literature as a background

As discussed above, in this survey we are motivated by some important recent cases in the digital economy and emphasize some new aspects of how markets work and the corresponding need for new research. However, we also stress the continuity that should exist both in the economics analysis and in competition policy: when moving forward to applications in new markets, ignoring past results is not an appropriate way to proceed. Many of the issues that surface as important in digital markets have been or should have been also studied otherwise in some way. However, the difference in scale is often so large that from a practical viewpoint the priorities for what really matters, the nature of how the forces interact and the application of policy analysis is often as if we are facing a completely different market environment. The challenge, for each case, is to try to disentangle what are the new elements that play the key role. Online travel agencies for example make searching for a hotel reservation in London a much different activity for a Brussels resident than it used to be. However, we could principle have had, (and of course, we did have, travel agents before the Internet time and also we could have (and we sometimes still have) online search without online platforms to act as intermediaries. So it appears that it would not be a fruitful or efficient way to consider existing research as irrelevant or obsolete. Instead the key is how to use existing results, to refine, extend and enrich them in the context of what is called the digital markets.

There are at least two important related literatures within IO that are relevant here and by their nature necessarily closely related to the currently open competition issues. These refer to the study of vertical relations (integration and vertical 'restraints') and to pricing practices, in particular, price discrimination and non linear pricing. We outline the very important recent progress that has been made in each of these areas, but also identify areas that are still not fully explored and are still both open and important. The challenges faced by researchers in each of these areas are not trivial. We briefly review some of the ideas and advances, as a background for the more specific literature that follows, since by now there are available high quality surveys in each of these topics.

4.1 Pricing

Pricing has been naturally a core issue in economics, however, we may not have yet a complete understanding of how pricing functions when there is price discrimination and various types of non linear pricing under oligopoly competition, when there are vertical relations, and what are

the welfare implications of the various related restrictions, especially when we may have important dynamic effects. Overall, a key challenge is how to determine the welfare effects of (direct or indirect) price discrimination or of price restrictions, especially in rich environments where the technology significantly facilitates the identification of buyers or groups of buyers by (some of) the sellers and where the technology may make possible, and often very inexpensive or automatic, various price comparison practices (e.g. through websites). The matter is obviously complex and, not surprisingly, the current literature is not conclusive. This is true in the area of theory research but also in empirical work, where (partly due to the heavy restrictions coming due to the lack of high quality data) more work would be important, especially using data from European markets. Links to other areas, notably behavioural approaches, may also prove useful especially when referring to buyers that may understand their environment much less than the pricing agents.

An excellent starting point for the review of the broad issues in price discrimination is Tirole (1988, ch. 3), Varian (1989) and Armstrong (2008) and on nonlinear pricing Wilson (1993) and Armstrong (2015). In general, prices play two important roles in economics which are distinct but closely related. They determine how surplus is divided between buyers and sellers, for a trade that takes place and, at the same time, they determine what trades will and what will not take place. Holding the trading activity fixed, the price level will only determine consumers and producers surplus but not total welfare, if we define it as the sum of the two. However, if prices become too high or too low (for strategic or regulatory reasons), what trades will take place will also be affected.

We have price discrimination when two identical (in practice, 'similar') products have the same marginal cost to produce but are sold by a seller at different prices (this definition has been extended, by Stigler and others, to cover the case of different cost structures: the proportional mark-ups should not be different). The impact that price discrimination has on consumers' surplus, rival firms and welfare is mixed. In general, price discrimination will tend to allow more trade to take place, but at the same time allows the sellers that employ this practice to capture more of the surplus created (see e.g. Varian, 1985).

Price discrimination is important for competition policy for at least three reasons (see Armstrong, 2008). First, one may consider price discrimination as part of an 'exploitative' abuse by a dominant firm – however, in practice and probably for good reasons, this path is only rarely followed by most competition authorities, although the legal framework in Europe may allow it. Second, as also discussed earlier in this text, promoting the single market across the EU is stated as an independent objective by the EC. It is often expressed in practical terms as not allowing firms to set different prices across regions, or at least to not prevent arbitrage across

regions that would tend to indirectly equalize prices. Third, and a matter that has received much attention by competition authorities, price discrimination can be used by a dominant firm to “exclude” (or weaken) actual or potential rivals. The question there is in which cases price discrimination can be an effective way to put rivals at a disadvantage so as to make them exit the market or compete less aggressively.

For price discrimination to be possible and effective three factors are known to be important and required, (and are all related, in fact, to the study of digital markets). First, pricing firms have to have some market power (otherwise they will have to be price takers). In digital markets, we tend to have at least some players who have significant market power (or at the very least high market shares), and these could in principle price discriminate while some other players are too small for that. Second, there has to be some information about buyer values (either directly or indirectly, e.g. through past sales or some other correlated characteristic of the buyer population). In digital markets, information about the identities of actual or prospective buyers tends to be much easier to obtain (e.g. through web-browser cookies or the exact purchasing history of end users), and this is why price discriminations comes to the center of the picture in the analysis. At the same time, ‘geo blocking’, where access to content can be allowed to users residing only in some areas, even though technologically a wider access would be very easy is an important issue, Third, there has to be restrictions on arbitrage that would otherwise tend to undo the effect of discrimination. Vertical restraints other pricing restrictions are very important in this regard.

As discussed, an important issue is that the new technologies allow firms to have more detailed digital information about their customers, returning or new, a feature which provides new mechanisms for price discrimination. When firms have information about consumers’ previous buying behaviour, they would benefit from using this information to offer different prices or products to consumers with different purchase histories. With web- browser cookies and other information technologies firms can collect and process important information about consumers, and can affect the prices and products offered to them, individually or as groups.³⁴

In terms of some fundamental results, Hart and Tirole (1988) have considered the fundamental problem of pricing over time when consumer valuations are not changing across periods, and a monopoly seller can trace the identity (although not the exact reservation value) of those who have bought in the past. Competition has been introduced into this problem by Fudenberg and Tirole (2000) and Villas-Boas (1999), where firms learn both about the values of the buyers that

³⁴ See e.g. Fudenberg and Villas-Boas (2012) for a focused and very clear exposition of the main forces in terms of theory.

buy from them but also from rivals. Chen and Percy (2010) extend the theory model by allowing variation of values across time period. Buyers may also wish to act strategically, as in Villas-Boas (2004). The more relevant perhaps part of this literature is when learning about consumers values may be active, that is the firms strategies include how much information about key buyer characteristics they may obtain. Relevant two sided market issues can be found e.g. in Armstrong (2006) and subsequent work.

4.2 Vertical relations

The study of vertical relations necessarily finds in its way the issue of bargaining and of the distribution of power across vertically-linked firms. Such firms act both as collaborators, since they trade goods and services with each other, and at the same time competitors since they compete in sharing the joint surplus, a feature which makes the problem inherently difficult to analyze. Relating these ideas to policy, the 2010 EU Guidelines on Vertical Restraints is a rich and relevant document that may suggest areas where some more clarity based on academic research is needed. One area of importance, for both research and competition policy practice, is the more detailed definition of online sales and study of the phenomenon. Treating all online sales as 'passive' sales, and with restrictions on these not being allowed, the assessment of practically any restriction of cross-border online sales has to take a predetermined direction which may not be necessarily correct. Resale Price Maintenance (RPM) is also an important topic for further research, with part of the economics approaches not being always aligned with the direction of the Guidelines or with some recent policy practice. Naturally, especially with the joint presence of both online and offline sales, when competition is examined, it is also important to examine the relevant investment incentives by the suppliers, since quality improvement may often be at least an important an issue as pricing.

An excellent starting point for the review of the broad issues in vertical relations and in particular of vertical 'restraints' are Motta (2004, ch. 6), Rey and Tirole (2008); Rey and Vergé (2008) and Lafontaine and Slade (2008).

Along a 'vertical chain' we can view the vertically linked firms as the producer and the retailer, or the buyer and the seller, or more abstractly as the 'upstream' and the 'downstream' firm. Vertical chains differ in many ways: whether there are two or more stages before reaching the final consumer, whether firms are vertically separated (independent) or vertically integrated (one firm that operates both upstream and downstream, with the goal of maximizing its joint profit), and whether trade is exclusive (with an exclusive supplier or exclusive buyer or both) or more than one firms are actively trading at each stage.

Trade between vertically linked firms takes a simple form, where a single price per unit of quantity sold is arranged. Under vertical separation and linear pricing, when we have a constant price for each additional unit sold, vertical separation leads to higher final product prices than those we would have under vertical integration (VI). This ‘double marginalization’ is one of the fundamental and quite well understood results in the literature (Spengler, 1950). The result relies on each firm acting independently from the others, in the sense that it seeks to maximize its own profit and not that of the entire chain. It implies prices for the final consumers that are *higher* than the prices that would emerge under vertical integration. In this sense, vertical separation with linear pricing hurts both the consumers and the firms, because independent firms fail to internalize the vertical externality between them. Naturally, one solution to this problem would be vertical integration. Importantly, however, the problem can also be eliminated if alternative, “nonlinear”, pricing schemes are used instead, like two-part tariffs. Under such arrangements, and in the absence of uncertainty, if for example the per-unit price is set at the competitive level (cost) and the fixed fee is set a little lower than the total monopoly profit, the exact monopoly solution can be recovered, without having formally a vertical integration arrangement. Another way to solve the double marginalization problem in this case would be some vertical restriction, in particular RPM that would fix the final market price at the monopoly level. Also note that the outcome depends on the distribution of bargaining power across the chain. If e.g. we allow the downstream firm to have the price setting power, against both the final consumers and the upstream firm, only one profit margin can be applied and there is no additional distortion relative to the standard monopoly one. Finally, when the downstream firm is able to participate in setting the price at which it transacts with the upstream firm, the formal or informal bargaining procedure that is expected to take place between the upstream and the downstream firm would restrict the market power of the upstream firm and would lead to the internalization, at least partially, of the final market price considerations. As a result, the final price will be *lower* in the equilibrium of the game when the bargaining power is balanced between the upstream and the downstream firm, or when the downstream firm is more powerful rather than the upstream firm.

In a typical market, of course, one encounters much richer vertical structures than the simple one-supplier-one-distributor chain. As a result, in addition to the basic vertical double marginalization effect discussed above, we may also have horizontal externalities, arising in the competition among several wholesalers, or several retailers within a single vertical chain, a phenomenon that we could call ‘intra-brand’ competition. This emerges when one, or more suppliers trade with more than one distributor. In such cases, it is not only the vertical strategic interaction between suppliers and distributors that matters, but also all the horizontal relations.

In cases where only intra-brand competition downstream is important, nonlinear pricing schemes or other vertical restraints could be effective in ‘softening’ the competition in the final market and maximizing the suppliers’ (upstream) profits. Importantly, in the case of a two-part tariff, the wholesale price level may control the horizontal externality and soften competition between the distributors, while profit may be shorted upstream in the form of a fixed fee. RPM, or other resale restrictions set by the supplier, such as restrictions on the retailers’ discretion to set a price, or restrictions imposing that each retailer only deals with a part of the final demand, in a territorial or other sense, could also lead to higher downstream prices and higher profit for the entire chain.

Rey and Vergé (2008) provide an excellent analysis of how vertical ‘restraints’ operate and a review of recent work in the area, focusing on the horizontal externalities that such constraints may affect along with the vertical contracting issues.³⁵

5. Research on competition issues in digital markets

5.1 Price differentials and intermediaries

Some recent work considers specifically the effects that the ability to price discriminate or the lack thereof (because of strategic or regulatory reasons) has in the market when there are vertical relations. Edelman and Wright (2015) examine the implications of ‘price coherence’, the constraint that the purchase from an intermediary has to occur at the same price as the purchase of the same good directly from the initial supplier or through some alternative, competing, intermediary. This pricing practice is often used in payment card systems, travel reservation systems, rebate services and other related. It differs from some other vertical restraints like RPM. RPM would restrict the absolute prices while price coherence restricts relative price differences. Also in comparison to a standard MFN, these would tend to not allow

Edelman and Wright (2015) set up a theory model where an intermediary provides a benefit to buyers when they purchase from sellers using the intermediary’s technology relative to the possibility of a direct purchase. They show that the intermediary would want to restrict sellers from charging buyers more for transactions that it intermediates. With this restriction an intermediary can profitably raise demand for its services by eliminating any extra price that the

³⁵ Mathewson and Winter (1984), Mathewson and Winter (1988), Martin et al. (2001), Marx and Shaffer (2004), Marx and Shaffer (2007), Dobson and Waterson (2007) and recent applications by Asker and Bar-Isaac (2014) and Asker and Seitz (2013).

buyers may face for purchasing through the intermediary. They show that this leads to inflated retail prices, excessive adoption of the intermediaries' services, over-investment in benefits to buyers, and a reduction in consumer surplus and even sometimes welfare. Competition among intermediaries intensifies these problems by increasing the magnitude of their effects.

5.2 E-books and pricing (via the agency model)

There are now several papers motivated by the Apple e-books case and other related cases in markets where content providers supply content via online platforms. We review some representative ones. Several analyses compare, in different models, standard wholesale pricing schemes, where the upstream firm (say a publisher or other content provider) charges a wholesale price for the good to the downstream retailer who then sets a final price for the good to agency contracts. In agency contracts, in contrast, the retailer sets a percentage commission that he will collect from the sales of the good, and the upstream firm is free to set the good's final price. Effectively, via the agency model, upstream firms choose the retail prices of their products (that is we have effectively RPM) subject to a fixed revenue-sharing rule. The matter has received significant attention, with competition policy makers being generally adverse against the agency model.

Johnson (2013) contrasts wholesale and agency agreements. The paper extends standard models of product differentiation (spatial competition) to incorporate bilateral oligopoly in order to investigate the agency model of pricing when there is consumer lock-in. As explained, in the paper, in the e-book market lock-in may exist because a consumer becomes accustomed to using, e.g. Amazon's e-book store or e-book reading app. The equilibrium analysis shows that the agency model raises prices initially but lowers them in the future. Consumers are better off under the agency model. While price increases are a natural consequence of the transition from the wholesale to the agency model, it is not correct to conclude that consumers are worse-off overall. Consumers are better-off, though prices increase initially following the move to the agency model. The logic relies on the assessment of longer-term price effects, for which lock-in is important, compared with the short-run.

In a related model where consumers face switching costs when purchasing from a new distributor, Johnson (2014) focuses on the use of MFN clauses and their impact under both agency and wholesale agreements. It is found that the agency pricing model does not eliminate double marginalization, since in equilibrium retailers continue to impose a mark-up. The reason is that the revenue-sharing contracts that the retailers select distort the perceived marginal cost of suppliers. When retailers compete in revenue shares, however, adopting the agency

model lowers retail prices and industry profit, while retailers' profits increase. MFN clauses that impose retail price parity can facilitate the emergence of high industry prices, but in some cases may also raise market-entry incentives and in this way eventually benefit consumers. These results provide an explanation for why many online retailers have adopted both the agency model and MFN clauses.

Abhishek, Jerath and Zhang (2015) study entry and compare equilibrium outcomes under wholesale and agency agreements when a monopolist publisher sells online goods through two competing distributors (e-retailers). They find that when the e-channel has a negative cross-effect on demand in the traditional channel, it is optimal for the e-retailers to adopt the agency selling agreement. If the e-channel has a strong positive cross-effect on demand in the traditional channel, the e-retailers prefer to adopt the reselling agreement. They also find that as the intensity of competition among e-retailers increases, they prefer agency selling over reselling. The agency selling is beneficial for consumers as prices are lower under agency selling and consumer surplus is higher. When sales in the electronic channel lead to substantial stimulation of demand in the traditional channel, e-retailers prefer reselling. Yet, as competition between the retailers increases, e-retailers prefer to use agency selling.

Foros, Kindand and Shaffer (2014) also study the equilibrium properties of the agency pricing model and the impact of market competition at both the retailing and the publishing (upstream) level. They study a set of alternative assumptions, depending on how intense competition is at each stage and on how contract terms are selected. They show that employing this pricing model leads to higher prices if the competitive pressure is relatively higher downstream than upstream. That upstream firms earn positive surplus even when platform providers have all the bargaining power also that with asymmetric business formats, that is when only some platform providers use the agency model, an MFN clause at the retail level leads to retail prices that resemble the outcome under industry-wide RPM.

Gaudin and White (2014) set up a model to study more closely the effects of Apple's entry into the e-book market in 2010 and the related equilibrium pricing incentives. Like the work reviewed just above, they contrast agency and wholesale vertical agreements. The model equilibrium is characterized both in the presence and in the absence of an 'essential device' sold by the retailer. This part of the model corresponds to the fact that, before the Apple entry, Amazon who was a dominant retailer controlled an essential access device (the Kindle) while agreements regarding e-book pricing followed wholesale pricing. Subsequently, two distinct changes took place, first no device was any longer essential, and second Amazon's pricing agreements with publishers took the agency form. The novel aspects of the model are the interaction between the device and pricing contracts (with the device prices endogenous in the

analysis) and also that properties of the downstream demand are identified to favour one or the other pricing arrangement. There are two main results. First, the comparison between price levels arising under agency and wholesale contracting arrangements hinges crucially on whether one of the firms controls a complementary market (that is, the device). Second, a demand feature is identified (loosely, that demand does not become too convex too quickly – more formally that the elasticity of demand strictly decreases as quantity increases, up to the point where marginal revenue reaches zero) as the key for the pricing comparison. The basis for the main result is that, when the good can be consumed without using the essential device (or equivalently when there is competition among substitute devices), there is double marginalization under both forms of pricing. Depending on the shape of demand, that final prices under wholesale are higher than under agency.

Condorelli, Galeotti and Skreta (2013) also study alternative pricing terms when the downstream firm has more information about the final demand than the upstream firm. The analysis provides a justification for the prevalence of the agency model in online markets. In the model, a seller has an object for sale and can reach buyers only through intermediaries, who also have private information about buyers' valuations. Intermediaries can either mediate the transaction by buying the object and reselling it, or refer buyers to the seller and release information for a fee, the agency model. The merchant model suffers from double marginalization. The agency model suffers from adverse selection since intermediaries would like to refer low-value buyers, but retain high-value ones and make profits from resale. In equilibrium, intermediaries specialize in agency. Joint profits equal the seller's profits when he has access to all buyers and all intermediaries' information and the division of profits depends on seller's and intermediaries' relative bargaining power.

The work reviewed in this subsection has been in theory analysis. Viewed as a set, the results obtained in the recent literature generally cast doubt on the view that pricing according to the agency model leads to lower prices or welfare compared to the standard wholesale pricing model. The analyses are conducted with different model modifications, such as with buyers' switching costs, asymmetric information, complementary goods, and demand interaction between online and traditional sales. It follows that competition policy may need to seek more guidance when it comes to banning pricing according to the agency model.

On the empirical side, there is still only very little work on the topic of how different pricing arrangements affect equilibrium prices, profits and welfare. This is despite the fact that the theory analysis offers mixed results, as explained above, with the outcomes depending crucially on some parameters; therefore the empirical guidance towards the formulation of policy would be very useful. One notable study on the empirical side is by De los Santos and Wildenbeest

(2014). They perform a difference-in-differences analysis to estimate the impact of the switch from the agency agreements to wholesale pricing on e-book prices. The dataset used in the analysis contains daily prices of e-books for a large number of titles, collected in the U.S. across some major online retailers. The analysis exploits cross-publisher variation in the timing of the return to the wholesale model to estimate its effect on retail prices. It is found that e-book prices for titles that were previously sold using the agency model on average decreased - by 18 percent at Amazon and 8 percent at Barnes & Noble. The results illustrate a case where upstream firms prefer to set higher retail prices than retailers. In this way, the analysis helps partly clarify some of the conflicting predictions in the theory work described just above.

The above mentioned paper also investigates the pricing strategies of the retailers and publishers in some greater depth, investigating some alternative theories. The data shows that due to the relatively higher commission kept by the retailers, on average e-book profit margins for the publishers were lower during the agency period than afterward. The analysis does not provide evidence that the pricing strategies of the retailers are primarily intended to lock in consumers, as argued in the analyses by Johnson (2013) and Gaudin and White (2014) sketched above. In particular, Amazon's retail prices decreased after it regained the ability to set retail prices, and have remained consistently low despite having reduced means to leverage the Kindle platform due the availability of Kindle apps for mobile phones etc. The paper therefore characterizes as likely that other factors explain the publishers' adoption of the agency model, such as fears that lower e-book prices may cannibalize print books sales or diminish the perception of the books' value. Another important effect may be the one examined by Jullien and Rey (2007) where upstream firms may engage in RPM at high retail prices as part of a collusive upstream agreement that prevents them from engaging in secret wholesale price cuts. Yet the analysis does not find any indication that wholesale prices went up, even though publishers' coordinated move towards the agency model raised retail prices. Clearly, more empirical studies of other related cases would be extremely useful.

Baye *et al.* (2013) study empirically how different online platforms that consumers use to search for books and booksellers operate. They find that the use of these platforms is shifting over time. The data they present suggest that, as a result of digitization, consumers are increasingly conducting searches for books at retailer sites and closed systems and not so much in general search engines. This paper also identifies and discusses some areas where more work would be needed in relation to the pricing of ebooks and digital media but also specific challenges that will make it difficult for researchers to measure internet-based search behaviour in the future.

5.3 Additional research directions

Geographical restrictions imposed by firms is an application of price discrimination strategies in order to separate across market segments where elasticities may differ. Parallel trade, in turn, is a way to seek alternative channels, so that the buyers could seek for the most favorable price or product characteristics, in the context of arbitrage that would tend to undo price discrimination. Parallel trade specifically has been studied among other work in Valletti and Szymanski (2006), also by Ahmadi and Yang (2010), while an early paper on Most Favored Nation clauses across markets is by Akman and Hviid (2006).

One of the key issues in digital markets is the use of personal data and related privacy issues. Access to data about buyers (e.g from past purchases) can be used by the buyers themselves, however such data sets certainly have a value and (depending on the legal restrictions) could be transferred to third parties. See Acquisti and Varian (2005) for an early approach to the issue and Acquisti et al. (2015) for a comprehensive survey. The willingness of buyers to offer access to personal data, may also be dependent on their understanding of the market and legal environment; the matter is also related to behavioral approaches to markets and competition (see e.g. Acquisti, 2010, Koszegi, 2015, and Zhang, 2010).

6. Conclusion

In the last couple of decades, competition policy has been receiving increasingly higher attention and has obtained a central role in micro-economic policy around the world and certainly in Europe. The rationale behind this development is the notion that insuring that markets work as competitively as possible is the key for economic growth and sustainable improvements in the economic welfare of the population. Academic research, on the theory modeling, empirical analysis and policy evaluation fronts, has contributed towards shaping the developments in competition policy, as well as the formulation of the legal framework and decisions. This is true despite the fact that the various developments have not been without different opinions, often strong, about what is the right approach in competition policy. Certainly, as much progress has been made in the academic research and in competition policy itself, the markets themselves are moving even faster. New topics such as the relative size increase in the digital sectors of the economy, and especially the way that digital technologies and e-commerce practices revolutionize essentially all other sectors of the economy, imply some new and important challenges for academics and policy makers.

Many of the issues that surface as important in 'digital markets' are not necessarily new or completely absent in more traditional (off-line) markets and have been also studied or at least

could have been studied in other contexts. However, the difference in the degree of importance of each such issue can be so large, that from a practical viewpoint the priority for what really matters, the nature of how the relevant forces interact in equilibrium and the application of policy analysis often tend to be as if we are facing some completely different market environments. Therefore, research on the topic has to move in the next few years along a delicate balance. On the one hand, important central results from the existing and ongoing industrial organization research have to be used, even if possibly re-organized, re-interpreted and understood under some new light. On the other hand, the problems studied often call for some completely new approaches, where the analysis would explicitly shift the focus towards the strong economies of scale and scope, networks effects and other features that create non-convexities in the models and imply that competition becomes more dynamic in nature than we currently recognize in our standard models.

As an illustration, a core difficulty underlying the subject studied in this survey is how to determine the welfare effects of price discrimination (direct or indirect) or of specific price restrictions (direct or indirect), especially in rich environments where the technology significantly facilitates the identification of buyers or groups of buyers by (at least, some of) the sellers. In particular, the digital technology may make possible, and often very inexpensive or almost automatic, various price comparison practices, e.g. through websites.

It does not appear that the right way to proceed is to claim that the analysis of these new markets environments always require a whole new set of research that would make the existing one obsolete; the key is how to use some of the existing results, refine, extend and enrich them in the context of what is called the digital markets. Ignoring the fundamental economics simply because some competition cases appear to be new, would be misguided, perhaps reminiscent of how some finance analyses thought that the fundamental economics could be ignored during the creating of the dot.com bubble in 90s. Thus, it would not be the best way to proceed to argue that the shift to digital markets makes old results in economics research obsolete and that, by implication, only a formalistic approach to the application of competition policy could make sense. Such an approach would be especially wrong if it is accompanied by a tendency to block new innovative strategies employed by firms in their effort to be competitive. While these may not fall directly in the area that competition policy practice understands as 'safe harbors', they may very well lead to significant welfare improvements via innovation. This can be done by offering to consumers new services or by leading to efficiencies.

Yet, while the application of competition policy should be characterized by continuity whenever possible, and the new problems faced can be found in some ways and a lesser extent in other

markets, the co-existence of some important novel characteristics implies that in the digitalized economy we have a new landscape that needs to be systematically explored, both on the theory modelling and the empirical research sides. With strong network effects and economies of scale, a tendency for high market concentration, strong effects across markets, what becomes relatively more important is to ensure innovation is possible and attractive for businesses and that any entry barriers are not higher than necessary. The benefits from innovation, even if they tend to be high to the successful innovators and imply for them high market shares and profits, can also be very high for the consumers. These benefits can often be much higher than the static benefits from one could expect from the application of standard price competition arguments. Economic analysis has to incorporate to a much greater extent dynamics in order to be more useful for the understanding and formulation of competition policy. Competition policy in turn, should have as a prime objective to ensure that firms have the incentive and the room to innovate, offer new products and open new markets. In digital markets, this does not only mean innovation on the technology side, but often in experimenting with new approaches about how various needs of consumers can be served.

The issues studied in this analysis are of significant complexity and importance and naturally the existing literature is not conclusive with respect to all key questions. This holds true in the area of theory research but also in empirical work, where partly due to the heavy restrictions stemming from the lack of high quality data, having more work would be quite important. At the very least, since theory models cannot offer a definite conclusion and policy recommendation in all the cases, by the nature of the issues studied, it is important that high-quality empirical studies, using data from European markets are conducted (as the larger number of existing studies is based on U.S. data). These will have to be used in parallel with the theory modelling, at least as a way to quantify opposing forces on which equilibrium outcomes may crucially depend. Further, links to other areas, notably behavioural approaches, may also prove useful especially when referring to buyers that may understand their environment much less than the pricing agents or who may be concerned with privacy issues. Overall, the ground that has to be covered is significant, and the research prospects appear quite exciting.

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