Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

04-Apr-2016

English - Or. English

DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS
COMPETITION COMMITTEE

DAF/COMP/LACF(2016)26
Unclassified

LATIN AMERICAN AND CARIBBEAN COMPETITION FORUM

Session I: Disruptive innovation in Latin America and the Caribbean: Competition enforcement challenges and advocacy opportunities

-- Contribution from the IDB Secretariat --

12-13 April 2016, Mexico City, Mexico

The attached document from the IDB Secretariat is circulated to the Latin American and Caribbean Competition Forum FOR DISCUSSION under Session I at its forthcoming meeting to be held on 12-13 April 2016 in Mexico.

Contact: Ms. Lynn Robertson, Global Relations Co-ordinator, Competition Division [Tel: +33 1 45 24 18 77 -- E-mail address: Lynn.ROBERTSON@oecd.org]

JT03393183

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LATIN AMERICAN AND CARIBBEAN COMPETITION FORUM

Comisión Federal de Competencia Económica

14th Latin American and Caribbean Competition Forum
12-13 APRIL 2016, Mexico City, Mexico

Session I: Disruptive innovation in Latin America and the Caribbean: Competition enforcement challenges and advocacy opportunities

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COMPETITION POLICIES IN THE INTERNET-BASED INDUSTRIES: THE NEED TO REBOOT THE DEBATE

-- CONTRIBUTION FROM THE IDB SECRETARIAT[1] --

Abstract:

This paper exposes the limits of competition policy in the assessment of Internet-based industries. These limits are traceable to a static/structural paradigm in neoclassical economics that finds innovation an alien concept that is difficult to grasp and analyse under the basic equilibrium tenets of this mainstream paradigm. Hence, no wonder that Internet based industries run through online platforms are perceived by competition analysts awkwardly; two-sided markets do not align well to the conventional market power assessment done under competition policy. Proper assessment of disruptive or incremental innovation requires changing the analytical framework in order to make the causes of innovation visible. The main determinant of innovation is the appropriability that innovators develop through dynamic capabilities. Under this assessment, Internet-based fulfill an important welfare enhancing role, in promoting reducing the search for information costs, stimulating further innovation by slicing, apportioning and recombining customers, as well as several other long run benefits.

"Monopoly is necessarily a part of the welfare ideal."
(E. Chamberlin, Towards a more General Theory of Value, 1949)

[1] This background note was prepared by Ignacio De Leon (IDF/CTI), Private Sector Development Lead Specialist, Inter-American Development Bank as a contribution for the discussion of Session I of the 2016 LACCF.

The views expressed in this paper are the personal responsibility of the author and should not be attributed to the IDB.

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1. Introduction

1. The development of Internet-based industries (i.e. Uber, Lyft, Airbnb, HomeAway, Zipcar, Kickstarter, etc.) has radically changed the landscape of key industries including transportation, hotels, and financing, to name a few. The new wave of disruptive innovation seems to be defined by firms who offer a fundamental challenge to existing business models. Industries such as retailing, for-hire car services, bank lending and the like have all suffered disruptive entry. These industries have well established, if not entrenched, business models that have not altered significantly in many decades. Accenture (2016) recently issued a report focus on changes that will impact enterprises in the next three to five years. The report is aimed at putting the digital revolution into context for companies that need to shift their strategies for the coming years. The digital economy now accounts for 22 % of the world's total economy, up from 15 % in 2005. That percentage will grow to 25 % by 2020.

2. The perception of the executive interviewed cannot be more eloquent: 28 % believe technology will change at an "unprecedented rate" over the next three years. 58 % said it would increase rapidly. 37 % of executives said that the need to retrain the workforce is significantly more important today compared to three years ago. They also pointed to massive shifts, like General Motors investing USD 500 million into ride-sharing service Lyft in an effort to transform itself from a carmaker to a transportation services company. Before the recent turbulence in the stock market, unicorns (startups that have a USD 1 billion valuation) were being created at a rate of one per week.

3. In this fast paced movement towards the adoption of digital business models, the report emphasises the relevance of online platforms: "The next wave of disruptive innovation will arise from the technology-enabled, platform-driven ecosystems now taking shape across industries. Having strategically harnessed technology to produce digital businesses, leaders are now creating the adaptable, scalable and interconnected platform economy that underpins success in an ecosystem-based digital economy." One statistic stands out in this assessment: In 2016, 15 platform companies have a collective market capitalisation of USD 2.5 trillion.

4. In a similar fashion, the regulatory systems that have arisen around these industries are highly reflective of the business models of the incumbent firms themselves. That obviously raises questions about how regulation and competition policies should adapt to this fast emerging new reality. How does this development impact our perception of the nature of competitive processes and what role does competition policy have to play in promoting it? The question addressed in this paper is what role, if any, is competition policy to play in the promotion (or rejection) of "disruptive innovation" business models implemented through online platforms.

5. To address this issue, we first inquire what is the most adequate analytical framework to understand the phenomenon of disruptive innovations; then we examine why the structural language of competition policy is unfit to deliver a meaningful understanding of this phenomenon as it misleads the analyst into assuming that structure causes innovation, yet the empirical evidence is scant and unsupportive. The next section presents an alternative language for the analysis of innovation; this paradigm stresses the dynamic outlook of innovation, and the role of institutions, such as business arrangements, of which online platforms are one example. After understanding the institutional welfare effects of these platforms, we turn our attention to the policymaking needed to enhance their welfare role. The last section sums up the conclusions of this paper.

2. What analytical paradigm best approaches the study of Internet-based industries?

6. Before we explore the "disruptive" effects of Internet-based industries, it is important to settle the analytical framework that we will employ to examine this new phenomenon. How do we know that we know? This is not a trivial question. As Stigler (1988) states, "definitions do not yield any knowledge about the real world, but they do influence impressions of the world." Clayton Christensen, author of the disruptive innovations theory also indicates that "applying the theory correctly is essential to realising its benefits". For him, too, the question of selecting the adequate analytical framework is more important than the logical implications it yields. Definitions are thus important because they alter policymakers' perception about the welfare effects of entrepreneurial activity. Deciding whether online platforms are welfare-enhancing rests on preconceived assumptions about how markets work. These preconceptions are built around Kuhnian paradigms, which help us visualise certain problems as scientifically relevant and exclude others from our analysis.

7. In social science, paradigms are a particular *way* of rationalising reality. They represent "(...) a conceptual framework within which scientific theories are constructed; they are closed systems of knowledge whose parts are related to each other as well as to the whole structure. They focus attention on the object of research as a system; something that exists 'out there' as an integrated, self-contained entity or as a bounded structure." (Addleson, 1994: 98)

8. This paper maintains that the current analytical instruments used by competition policymakers to assess market competition are ill-suited to examine the fast changing pace of Internet-based industries. Competition policy tools emerged in the mid-20th century, in the midst of an industrial revolution characterised by industries that grew at a much slower pace. Also, the economic theory developed to explain these developments construed positive economics in terms of equilibrium, and normative equilibrium in terms of efficiency. Therefore, it is not surprising that the study of innovation has been conspicuously absent from the fray of mainstream economics, and that the tools developed under the spell of "efficient equilibrium" did not see relevant at all –actually, perceived innovation (and correlate notions of entrepreneurship, growth, economic change) as an analytical "nuisance" (i.e. outside the conventional "paradigm"). Innovation makes impossible to assess economic efficiency, as the new products and services change the perception of consumers on the value they can obtain from existing products and services in the market, thereby displacing the stability the analyst needs to calculate whether under a given point of time social resources are allocated to those who value them the most.

9. How did economic theory came about to develop this static view of markets is outside the scope of this paper. It will suffice to say that the turn of ideas in economic science at the dawn of neoclassical revolution in the 1870s gave priority to the development of mathematical modelling through equilibrium, over endogenous change (Warsh, 2006), and this understanding of economic science focused on allocating scarce (and static) resources (Robbins, 1932) came to dominate the economics profession.[2]

[2] The neoclassical research program avowedly developed an outlook of economic science resembling that of Newtonian physics, as it was perceived to be a "respectable" science model, capable of construing social laws with the help of elegant mathematical equations. Leon Walras, founder of the neoclassical tradition, had the conviction "that only with mathematics and by emulating the methods of natural sciences, and particularly the model of celestial mechanics, could economics become a true science." (Walras, 1862, quoted by Jaffe, 1965) Hamilton (1953: 18-28) expressly acknowledged this fundamental distinction, linking the Darwinian biological tradition (which he rightly opposed to the Newtonian program) to the emergence of the Institutional school of economics, whose main concern was far from making equilibrium models of reality for predictive purposes.

10. The mainstream perspective visualised economic change as a sequential succession of equilibrium stages, modified by exogenous changes; it could not understand innovation as an endogenous process of entrepreneurial discovery and change. In other words, the determinants of innovation were not part of the neoclassical models, but rather exogenous variables that forced previous equilibrium stages into new ones. As Sidak and Teece (2009:601) indicate, "innovation is at best an afterthought in static microeconomic theory. The presence of innovation complicates economic analysis. It destroys equilibrium, thereby debasing the value and usefulness of the familiar toolkit that most economists carry. It leads to indivisibilities, rendering marginal analysis of limited value. It generates and raises "appropriability" and "public good" issues."

11. Due to this insistence in imposing an equilibrium outlook to economic science, many references about how evolution comes about (e.g. Marshall's reference to the "trees in the forest" (1890, Book IV, Chapter XIII) were abandoned, in favor of formal mathematical modelling. From then on, static representations of the market, such as the purely competitive model (complemented in 1933 by Joan Robinson's Imperfect Competition model), came to portray the array of theoretical market structures studied under Industrial Organisation. Thus, market structure became the hallmark of the mainstream economic analysis.

12. Industrial Organisation built around the notion of more or less concentrated markets conceived alternative welfare predictions, under the so-called Structure-Conduct-Performance model. Under this static/structural model "market power" conditions the capacity of firms to entertain anticompetitive behavior and unilaterally influencing the conduct of their competitors.

13. Even though the policy has shifted increasingly away from a "hard" SCP paradigm, and the notion of "market power" has been watered down, the static, structural way of thinking about markets, of enclosed entities bounded by cross-price elasticity and geographical scope, has not receded. On the contrary, it represents the analytical core of competition policy manuals, guidelines, regulations and laws that comprise the body of competition policy, to this day, as will see in the next section. In Kuhn's terms, the structural layout of Industrial Organisation became *normal science*, which was imposed by the scientific community "through the standard textbooks and through education". (Loughlin, 1992: 31) Competition policy rooted in this paradigm seeks to minimise the deadweight loss of the Harberger triangles from monopoly (Sidak and Teece, 600).

14. Therefore, themes that could not fit within the framework of equilibrium –such as innovation- were excluded from the research program of mainstream economics.[3] Choosing the "right" analytical framework is as important as the very deductive implications of the analysis itself: not only help us see certain causalities, but also to deduce normative implications that support public policy. In the case of mainstream economics, there was a perception that mathematical modelling, and forecasting was of the essence of scientific thought, and that equilibrium could be the only possible way to achieve it. The outlook of economic science resulting from this Kuhnian paradigm would fail to incorporate "innovation" as part of its research agenda. Innovation would be construed as exogenous changes that would make equilibrium shift from one state to another.

[3] As Kuhn (1962: 37) stated: "One of the things a scientific community acquires with a paradigm is a criterion for choosing problems that, while the paradigm is taken for granted, can be assumed to have solutions. To a great extent these are the only problems that the community will admit as scientific or encourage its members to undertake. Other problems, including many that had previously been standard, are rejected as metaphysical, as the concern of another discipline, or sometimes as just too problematic to be worth the time. A paradigm can, for that matter, even insulate the community from those socially important problems that are not reducible to the puzzle form, because they cannot be stated in terms of the conceptual and instrumental tools the paradigm supplies."

15. Let us now examine more closely the epistemological difficulties of using neoclassical equilibrium models into the assessment of disruptive innovation.

3. Why competition policy tools are unfit to assess disruptive innovation?

16. The structural framework is present in the assessment that the literature of competition policy is increasingly making around digital businesses run through online platforms. Evans and Mariscal (2014) not only expect but also *wish* that soon there will be in Latin America a decision from a competition authority "that provides in-depth analytical considerations about market definition and power concepts in a highly, multi-sided industry". Others are not so hopeful about applying the structural analysis on Internet-based industries but implicitly endorse the structural mainstream assessment by extending this methodology to the analysis of networks.

17. Sidak and Teece (2009: 586-590) trace the received wisdom of market structure determining the intensity of innovation to the work of Joseph Schumpeter. This is not short of irony, since Schumpeter is often credited for being the most outspoken advocate of a process view in economics. Yet, in his 1911 work *The Theory of Economic Development*, he praised the virtues of competition fueled by small enterprises; later in his 1942 book *Capitalism, Socialism and Democracy* he would shift to the opposite direction, postulating that large firms with monopoly power are needed to support innovation. Either way, the conviction that innovation somehow had to do with market concentration was planted in the perception of the economists' profession.

18. Thus, the FTC (2003) endorsed the view that "competition can stimulate innovation" and that "competition amongst firms can spur the invention of new or better products or more efficient processes". The OECD (2013:10) makes a perplexing statement that supports this belief, simultaneously acknowledging that "empirical data does not resolve those conflicting theoretical forces (about the causality in the relationship between competition and innovation), as the empirical literature also reaches mixed results." Thus "although the question of what degree of competition leads to the greatest innovation is complex and probably varies from industry to industry, two key policy recommendations can be discerned from the available evidence: implement effective competition law enforcement to combat anticompetitive behaviour, and eliminate unnecessarily anticompetitive product market regulations." In other words, the empirical evidence does not support the theory but does support the policy. This is quite a startling statement.

19. The SSNIP analysis epitomises competition agencies' structural assessment. The test of small but significant and non-transitory increase in price (SSNIP) is used to define the relevant market in a consistent way. It is an alternative to ad hoc determination of the relevant market by arguments about product similarity. The SSNIP test is crucial in competition law cases accusing abuse of dominance and in approving or blocking mergers. Competition regulating authorities and other actuators of competition law intend to prevent market failure caused by cartel, oligopoly, monopoly, or other forms of market dominance. Clearly, competition policy instruments are perceived helpful to establish the market structure conditions believed necessary for innovation to flourish.

20. The antitrust literature also endorses this view. Posner (2001) contends that the antitrust analysis of dynamic industries is no different from the antitrust analysis of less dynamic, "smokestack" industries undergoing slower rates of technology innovation. In the realm of Internet-based industries, Evans and Mariscal (2014: 536-537) list the following competitive factors conditioning "market power" of business models based on the provision of services through online platforms: demand and supply substitutability; switching costs; multihoming; entry; and whether the innovation is incremental or "drastic". Also, Thepot (2012, 10) indicates more specifically the analytical steps to be conducted by competition authorities in order to assess market power in such two-sided markets. "The analysis encompasses several steps: the first

stage is the market definition that is used to calculate market shares in the relevant market. Then the market share must be put in relation with the potential competitive constraints that determine market power, including the contestability of the market, the existence of barriers to entry and exit for new competitors, as well as the possibility of consumers to switch to another service."

21. These opinions do away with the vast amount of research and empirical evidence suggesting that in fact the causality between market structure and innovation runs in the opposite direction; disruptive innovation being responsible for drastic changes in the number of incumbent firms.

22. Moreover, these opinions are flawed inasmuch they fail to acknowledge that one cannot assess the impact of an innovation based on the structural assessment of the market (i.e. cross price elasticity) because by definition innovation produces a novel product or service whose acceptance by the market cannot be ascertained with the help of previous factual inputs. The introduction in the market of an innovative product or services certainly flattens the industry's demand curve but no one can anticipate by how much; it all depends on the acceptance by the public, which in the beginning may well be unknown even for the innovator himself. In hindsight we know that Uber's business model has created phenomenal pressure upon taxi companies, to develop similar information networks between drivers and clients (not to mention other attributes of Uber, such as security and cleanness of the vehicles). But novel business models have not always been perceived innovative at the time they were introduced.

23. History is full of innovation oversights that led businesses to catastrophic decisions. We do not only refer here to the Beatles' rejection by Decca Records in January 1962, before they reached international stardom, saying "guitar groups are on the way out" and "The Beatles have no future in show business." Let's examine a few more cases involving technology development.

24. Take the case of Xerox. Xerox and that company's Palo Alto Research Company (Xerox PARC) invented many of the technologies that form the basis of personal computing, such as bit mapping, graphical user interfaces and Ethernet networking, much of which were incorporated into the company's Xerox 914 photocopier. Although the product was wildly successful, Xerox focused on the photocopier elements in research and development and ignored the personal computing aspects, allowing companies like IBM and Apple to take advantage of market opportunities much later. They did not see the future would be based on personal computing; therefore they missed the opportunity to jump into the wagon of the new market they had helped to create. They failed to forecast the effects of their own innovations.

25. But they were not alone in overseeing their own contributions; sometimes even shrewd entrepreneurs fail to foresee the full implications of their own inventions. Perhaps some will remember back in 2007 when Apple first told developers that to develop for the iPhone, they'd need to build WebApps for Safari? At least, that really was the plan. Walter Isaacson (2011) recalls how Jobs was stubbornly opposed to third party apps, and wanted to create web apps that could only be used through the iPhone's mobile Safari web browser. According to Apple board member, Art Levinson, "Jobs at first quashed the discussion" of allowing apps on the company's debut smartphone. Art called Steve "half a dozen times to lobby for the potential of the apps," but Steve was against them — "partly because he felt his team did not have the bandwidth to figure out all the complexities that would be involved in policing third-party app developers." [4]

[4] At the time, CEO Steve Jobs said: "The full Safari engine is inside of iPhone. And so, you can write amazing Web 2.0 and Ajax apps that look exactly and behave exactly like apps on the iPhone. And these apps can integrate perfectly with iPhone services. They can make a call, they can send an email, they can look up a location on Google Maps. And guess what? There's no SDK that you need! You've got everything you need if you know how to write apps using the most modern web standards to write amazing

26. So here we have Steve Jobs, reckoned as the wizard of innovations in the personal computer industry, the man who epitomised the forecaster of business trends in the digital industry, who failed to see the trend of the market, which was obviously pushing towards making the iPhone a carrier for the development of apps, whether WebApps for Safari or not.

27. Again, Jobs was not alone; history is full of similar episodes. Edison failed to see the phonograph as a device that would bring about the development of the music recording industry (he saw it as an answering machine); Propecia, the ubiquitous drug used to treat male-pattern baldness was originally marketed as Proscar, a drug to treat the benign enlargement of the prostate; Play-Doh, the kids' clay, was invented by Joseph and Noah McVicker while trying to make a wallpaper cleaner; Listerine was invented as a surgical antiseptic and a cure for gonorrhea. The list is endless.

28. Finally, the case of Kodak is emblematic. This company actually did focus on some digital photography innovations during the 1990s, including the creation of the film-based Photo CD and a computer printing dock for photos. But its focus on film's profitability and the chemical processes used to create that film led the company to make some inadvisable business decisions, focusing on maintaining their old chemical technology, rather than migrating to the new era of digital photography wholeheartedly.[5] So, in 2011, while Kodak was filing for Chapter 11, Instagram, the startup based on digital photography, hit the USD 1 BN mark.

29. Clearly, in these cases there is no possible prediction arising from knowing the incumbent's market shares, or other factor analysed under the SSNIP methodology. In the previous cases, like in the old Chinese folk story[6], we do not know the full consequences of events until they have played out. In our discussion, no one can tell *ex ante* whether innovations will entail radical changes in the industry, or whether they will trigger only incremental ones. Disruptive innovation suffers, to some extent, from the Duck Test – if it looks like a Duck, walks like a Duck and quacks like a Duck – it is a Duck! We know what it is when we see it – but defining in advance what it is, is more difficult. Yet, ex ante analysis is of the essence for public policy assessment.

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apps for the iPhone today. So developers, we think we've got a very sweet story for you. You can begin building your iPhone apps today. httpv://www.youtube.com/watch?v=8Vq993Td6ys.

5 For example, in 1988 Kodak paid USD 5.1 billion to acquire American pharmaceutical company Sterling Drug. The company hoped to utilize its expertise in chemical engineering to create drugs with high profit margins, but lacked the ability and resources to apply that knowledge in creating patented pharmaceuticals or extremely cheap generic medications. Kodak dismantled the Sterling operations and sold off the remainder of their pharmaceutical business for less than USD 3 billion only six years after acquiring Sterling. Peak employment at Kodak was experienced in 1988, when the company employed 145,300 workers across the world. In 1999, Kodak enjoyed its highest stock price ever, with shares approaching prices of USD 80. However, by this time the damage had been done, and the fall would be precipitous: Kodak stock was 78 cents per share as of September 2011, just months prior to the company's Chapter 11 filing.

6 The story goes like this: A farmer had only one horse. One day, his horse ran away. His neighbors said, "We're so sorry. This is such bad news. You must be so upset." The man just said, "We'll see." A few days later, his horse came back with twenty wild horses following. The man and his son corralled all 21 horses. His neighbors said, "Congratulations! This is such good news. You must be so happy!" The man just said, "We'll see." One of the wild horses kicked the man's only son, breaking both his legs. His neighbors said, "We're so sorry. This is such bad news. You must be so upset." The man just said, "We'll see." The country went to war, and every able-bodied young man was drafted to fight. The war was terrible and killed every young man, but the farmer's son was spared, since his broken legs prevented him from being drafted. His neighbors said, "Congratulations! This is such good news. You must be so happy!" The man just said, "We'll see." http://ymaa.com/articles/stories-proverbs/blessing-in-disguise.

30. These reasons also explain why it may be harsh to anticipate whether innovations will be "disruptive" or "incremental" at the time they have been developed. Even an *ex post* assessment may challenge the general perception of them being disruptive simply because they have a drastic effect on a given industry, such as the case of Uber and other similar digital businesses run on online platforms suggests.[7] Christensen et al. (2015) claim that the notion of disruptive innovation is very specific, and that is been used haphazardly: "In our experience, too many people who speak of "disruption" have not read a serious book or article on the subject. Too frequently, they use the term loosely to invoke the concept of innovation in support of whatever it is they wish to do. Many researchers, writers, and consultants use "disruptive innovation" to describe any situation in which an industry is shaken up and previously successful incumbents stumble. But that's much too broad a usage."

31. The source of confusion stems from a misconception about the analytical possibilities of the mainstream structural economic models. The assumption that past statistics can yield knowledge of future states conflates prediction of unknown events with logical mathematical deduction arising from the premises laid down in the model. As Sidak and Teece (2009:606) note, mainstream static/structural models are determinative, as opposed to the probabilistic evolutionary models. Static/structural mainstream models yield meaningful results as long as we hold the consumer preferences invariable and knowledgeable (so to be able to deduce their implications); that is, a long way apart from the heroic assumptions of consumer preference stability these models have upon cross price elasticity. In closer inspection it will be seen that the purpose of mainstream models is not really to predict, as it is to mathematically deduce how the assumptions play out in the model.

32. In short, competition policy mainstream analysis is unable to gauge innovation, as it focuses on deducing implications of past historical empirical data that by their very nature cannot forecast future events, trends and novelties. Also, for public policy purposes, branding innovations as "radical" or "disruptive" at best may be irrelevant, and at worst, misleading.

4. Monopolistic tendencies of the Internet-based industries: welfare enhancing?

33. Mainstream economics is not only unable to explain the evolutionary process triggered by innovation on the economy, but also –and more importantly, may drive the analyst into drawing misled normative implications about the welfare impact of Internet-based online business models.

34. This is perhaps best seen in the case of online portals. In its recent consultation, the European Commission (2015: 5) proposes a definition on online platforms. "an undertaking operating in two (or multi)-sided markets, which uses the Internet to enable interactions between two or more distinct but interdependent groups of users so as to generate value for at least one of the groups. Certain platforms also qualify as intermediary service providers."

35. Two-sided markets, also called two-sided networks, are economic platforms having two distinct user groups that provide each other with network benefits. The organisation that creates value primarily by enabling direct interactions between two (or more) distinct types of affiliated customers is called a multi-sided platform (MSP). Thus, the "two-sided markets" theory focuses on the structure of each size of the market organised through a given network of services.

[7] Therefore, definitions matter; not all innovations that claim to be 'disruptive' are actually so. Disruptive innovations target less demanding and less profitable market segments, which are overlooked by incumbent firms; to do so, they deliver a more-suitable functionality—frequently at a lower price. This explains why firms like Uber are not genuinely disruptive. Disruptive innovations originate in low-end or new-market footholds. Disrupters start by appealing to low-end or unserved consumers and then migrate to the mainstream market. Uber has gone in exactly the opposite direction: building a position in the mainstream market first and subsequently appealing to historically overlooked segments.

36. Mainstream opinion rightly perceives that two-sided markets cannot be studied like one-sided markets. "Defining two-sided markets is a complicated and unsettled issue. However, there is general agreement that accounting for the linkages between the two sides of the market is important. Given that two-sided markets involve two different sets of customers, a question arises as to how to treat the two sides when defining the relevant product market. Or to put it differently, there is the question of whether the two sided should be analysed jointly or separately. There seems to be an emerging consensus that a precise relevant product market definition is less important than making sure the linkages between the two sides, and the complexity of the interrelationships among customer groups, are taken into account. Mechanical market definition exercises that exclude one side usually lead to errors. Since two-sided platforms face a different profit maximization problem from the one that single-sided firms face, the traditional competition analysis methods and formulas from single-sided analysis, like the hypothetical monopolist test, do not apply to two-sided markets unless they are modified." (OECD, 2009:11)

37. Similarly, received wisdom perceives that welfare implications arise from the tendency towards concentration that these platforms generate, as they capture more clients on each side, thereby raising barriers to third parties. Given that they render benefits to each side of the network in the form of demand economies of scale these business models are perceived suspiciously as subtle forms of monopolistic behavior, because they raise entry barriers to third parties. Note that the only reason for this conclusion lies on the definition of competition, which is perceived as a form of "market structure" that two-sided networks tend to concentrate on each of their sides, hence, preventing them from narrowing the gap towards the purely competitive model.[8]

38. Yet, as said above, beauty is in the eye of the beholder. Welfare assessment changes depending on the particular lenses used in the analysis. It is clear that a static market structure implicitly conveys the assumption that market power built around market share incumbency influences innovation levels in a given industry. However, this assumption, emerged from the work of Shumpeter (1942) is neither empirically nor theoretically sound as Sidak and Teece (2009) attest. In their view market power or market share are not drivers of innovation because it does not ensure businesses that they will seize the profits accruing from innovation. There is no empirical evidence suggesting that market power influences the level of innovation. Actually, causation runs in the opposite direction such that innovation determines market structure (Sidak and Teece: 593). Clear evidence of this is given by the vast amounts of financial resources supporting university-funded and government-funded research in science and technology. Usually these funds are funneled highly innovative startups that change market structure through their control over valuable knowledge assets that embed their innovation. In short, Incumbency and market power are no prerequisite for innovation, and no particular firm size is conducive to technological progress. In the next section we examine more closely the full implications of an alternative paradigm focused on evolution, change and innovation.

[8] Users will pay more for access to a bigger network, so margins improve as user bases grow. This sets network platforms apart from most traditional manufacturing and service businesses. In traditional businesses, growth beyond some point usually leads to diminishing returns: Acquiring new customers becomes harder as fewer people, not more, find the firm's value proposition appealing. Fueled by the promise of increasing returns, competition in two-sided network industries can be fierce. Platform leaders can leverage their higher margins to invest more in R&D or lower their prices, driving out weaker rivals. As a result, mature two-sided network industries are usually dominated by a handful of large platforms, as is the case in the credit card industry. In extreme situations, such as PC operating systems, a single company emerges as the winner, taking almost all of the market.

39. Clearly, then, online platforms generate a tendency towards concentrating the market, but that does not mean that welfare may diminish; on the contrary, the existence of these platforms is the very embodiment of the innovative business model that unsettles incumbent firms and regulations protecting them. Chamberlin (1949: 93) noted the futility of the mainstream analysis, which tended to construe all states in the economy as pervaded by monopolies, since it appraised them from the vantage point of perfect competition. Hence, another vantage point is necessary: "the main point I want to make is that the welfare ideal itself (as well as the description of reality) involves a blend of monopoly and competition… If this is true, it is no longer self-evident on which side of the ideal lies the actuality for which a policy is sought. It is possible that the economy should be made 'more competitive'; but it is also quite possible that it should be made 'more monopolistic' instead.9 This alternative viewpoint does not appraise welfare being related to market structure; rather it takes product heterogeneity –source of market power under the mainstream analysis, as integral part of consumers' decision to choose product diversity over price, "thus wherever there is a demand for diversity of product, pure competition turns out to be not the ideal but a departure from it." (Chamberlin: 101)

40. If we adopt the perspective of Chamberlin's dynamic monopolistic competition explained above, it will be clearly seen that Internet-based industries may indeed restrict short-run rivalry (competition) but in doing so they increase the likelihood of promoting innovations, which in the long-run increase welfare. Therefore, to put it in Kuhnian terms, the *relevant scientific problem* to be examined is not what output restrictions would a service like Uber introduce (which the received wisdom has failed to pinpoint as "restrictive", as the piece from the 2009 OECD report shows), but rather, how does the platform achieve "institutional welfare" by increasing the connections between both sides of the network, thereby increasing membership value to agents on each side. Through the platform drivers find more options to employ their idle resources (cars) and passengers perceive improved quality or more options for their ride, thus creating a win-win situation.

41. How does economic theory explain the simultaneous existence of increasing returns[10] resulting from additional membership in the platform –that concentrate the market in fewer hands, with competition? The answer is simple: by changing the notion of competition, from a static, structural one that opposes market concentration to a dynamic notion, which perceives competition as an ongoing process of adaptation and selection amidst market unpredictability.

42. Let us now switch to this alternative perspective.

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9 Conspicuously, Chamberlin makes a point in differentiating this 'perspective' (which he calls 'monopolistic competition') from Joan Robinson's Imperfect Competition, which took perfect competition as the referential point from which to judge welfare states.

10 In the short run, firms would tend to bear increasing production costs, thereby stimulating decreasing returns: Costs will increase together with output levels. In the long run, however, industries usually diminish their costs, thereby favoring increasing returns on all participating firms. Alfred Marshall (1890) termed this finding a Law of Increasing Returns. According to this law, long-term equilibrium would bring about lower production costs for all the firms participating in an industry, no matter output increases.

5. How online platforms organise and promote dynamic competition

43. To the extent that innovation materializes a successful business opportunity that until then had remained uncertain, innovation creates certainty in the market by filling the gap of knowledge embodied by the assets created through the innovation process. Richardson (1996) explains how increasing returns are compatible with dynamic competition in evolutionary settings. Given free competition there is likely to exist, in this case, a tendency towards what may be called "dynamic equilibrium", a tendency, that is to say, for the rate of investment in product development to rise or fall towards the level at which this investment yields only a normal return. Thus, competition, increasing returns and innovation may co-exist.

44. This visualisation of (dynamic monopolistic) competition being aligned with increasing returns and innovation belongs to a broader alternative paradigm of economic theory. Schumpeter's notion of Creative Destruction popularised a dynamic, evolutionary perspective on markets, later developed by a line of thinkers working simultaneously under the research program of "evolutionary economics": Hayek (1948; 1978); Richardson (1953; 1960; 1996 [1972]; Competition, Innovation and Increasing Returns, 1996); Kirzner (1973); Nelson and Winter (1982); and Hunt (2000). Industrial dynamics refined this paradigm even further, through assessment of the internal firm structure (as opposed to mainstream market structure) and internal processes leading to the development of capabilities though learning, knowledge diffusion, sensing, seizing and reconfiguring (Klein, 1977; Abernathy and Utterback, 1978; Foss, 1997; Teece, 2007; Augier and Teece, 2008)[11]. In this paradigm, the question of how economic agents appropriate these dynamic capabilities is touchstone of the system; if the parties are unable to learn, to disseminate, to sense, to seize or to reconfigure these capabilities, they will be unable to dynamically compete through innovation.

45. Very importantly, appropriability does not depend on market structure, but from intellectual property strategy; the nature of the invention; and the degree to which knowledge about the invention is easily codified, so it can be imitated (Sidak and Teece: 594). These three elements are the keystone of dynamic monopolistic competition, and therefore they encapsulate the criteria to consider under an alternative dynamic monopolistic competition policymaking focused on the Internet-based industries.

46. In the Internet-based industries, disruptive competition appears to emerge from two combined forces: digital platforms able to bypass existing business channels and firms that are able to leverage that disruptive platform into new business models. Thus a firm like Uber can access a platform (the connected Smartphone) and leverage a business model (linking for-hire cars) to the abilities of the Smartphone. What makes Uber disruptive is the fact that the business model if offers does not fit into the established model for that industry. The same applies for a firm like Zopa, that offers P2P lending, or AirBnB, who offer a more effective platform for short-term holiday lettings. In many cases the sectors that the disruptors are involved in have been around in one form or another for some time, but they have never had the disruptive platform to allow them to offer effective competition to the existing business models.

[11] This is an evolutionary perspective on market processes, that can also be traced back to Adam Smith's metaphor of the Pin Factory, which encapsulates his notion of the Division of Labor and specialization of tasks (later developed by Young's notion of inter-firm specialization) leading to the development of new products and services through entrepreneurial learning. Under this alternative scientific research program, markets are seen as open-ended entities which reflect, above all, the subjective expectations of entrepreneurs interacting in a complex order. A good summary of this literature on "endogenous growth" is found in Beinhocker (2006) and Warsh (2006). Public policies conceived in connection with this research program acknowledge the inherent inability of government to maintain the pace of market interaction.

47. So what do platforms do? The OECD (2010:15) lists the following functions: reducing transaction costs to businesses and consumers by providing them infrastructure; reducing searching costs by collecting, organising and evaluating information; increasing information and social communication by facilitating improved customer feedback; aggregating supply and demand; facilitating improved competition through greater choice, more relevance, or lower price; providing trust; and taking into account the needs of all interacting parties by giving them access to a greater variety of products, more relevant products and businesses as an improvement in the collection and incorporation of information contained in customer feedback.

48. Most importantly, these online platforms allow an increased number of economic agents to appropriate their dynamic capabilities, thereby bringing about enhanced social welfare. Consider the case of Home Away or Airbnb, both websites for people to list, find, and rent lodging. Each listing allows hosts to promote properties through titles, descriptions, photographs with captions and a user profile where potential guests can get to know a bit about the hosts. Travelers (or "guests") search the available database of properties by entering details about when and where they'd like to travel. Travelers can further refine searches by making selections for several features associated to the lease. By enabling full use of real estate that otherwise would remain idle, these websites bring about a clear positive welfare effect to hosts; also travelers are presented with wider and cheaper array of accommodation alternatives, usually personalised and cheaper. Customers' reviews reward good service and clientele, thereby disclosing qualitatively useful information to both travelers and hosts. Dynamic capabilities in both sides are empowered: hosts may have a wider audience to clients to service; travelers have better information available about lodging options to spend their money in. In other words, both sides are placed in a much better position to fulfil their respective goals, through improved information searching skills.

49. These examples show these platforms' reliance on digital trust; first and foremost this is the key element of their success.

6. Building digital trust: the role of competition authorities in the Internet-based industries

50. Economic agents perceive digital trust to be the key element of success in the digital economy: 83% of respondents to the Accenture Technology Vision 2016 Survey agreed that trust is the cornerstone of the digital economy. Given its important role the question arises how government policymaking can promote social trust in online platforms.

51. Scholars have studied Trust in a variety of disciplines including economics, social, technological, and psychological. Mayer et al (1995) defined trust as the willingness of a party to be vulnerable to the actions of another party based on the expectation that others will perform a particular action important to the trustor, irrespective of ability to monitor or control the other party. Choi (1997) indicates how social conventions (i.e. platforms) emerge out of a social consensus that seeks to stabilise individuals' expectations amidst uncertainty: "The very development of conventions has the effect of stabilising the individuals' expectations about each other. As they are the results of individual's search for order and regularities, the majority of people in society can be seen as conforming to conventions. Those who conform to conventions, in turn, have the expectation that others will also conform, in that others' conformity is the necessary (and often sufficient) part of the viability of the conformists' action. Often, the expectations of others' conformity assume the character of customary rights."

52. Trust is necessary to cope with market uncertainty; when it develops, trust reduces the perceived level of risk or the subjective beliefs regarding the possibility of loss in the interaction. In the context of online platforms, these comprise a set of rules primarily aimed at encouraging new parties to develop mutual trust, thereby encouraging them to transact.

53. The importance of trust varies with the category (high-risk vs. low-risk) as well as nature of transaction (remote vs. local, buy vs. hire/rent), but there are certain elements that ought to be present: a) development of *positive feedback effect*, by increasing the number of parties that reinforce mutual trust of all participants; this is achieved through critical mass and activity/liquidity; b) *reliability*, that is, the portal should move beyond being an intriguing innovation to becoming a mechanism for reliably solving a pain point and/or delivering benefit; c) setting *a strong model for curation*, that is, a reliable way of separating good content from bad for a wider audience to find it useful. A high signal-to-noise ratio ensures that users can use the platform efficiently to find what they're looking for and be served the most appropriate content. In our previous case, AirBnB has focused on developing a strong peer-based review system, not just for hosts but also for travelers. It also, additionally, curates certain listings by sending certified photographers to take genuine pictures of the apartment.

54. In a similar fashion, regulation should reinforce each of these elements needed for online platforms to deliver results and to build trust. These are some elements to consider:

- Competition agencies should target regulatory obstacles that prevent the emergence of online portals or limit their services. Taxi drivers' licenses, insofar they just create a barrier to new entrants, should be eliminated.

- Establish minimum quality standards that align with the portals' curation mechanisms. Use of white papers and other means of identifying voluntary business standards for each industry could help the authorities devise general principles of fair conduct, a necessary element to promote regulatory reform.

- Complement customer reviews with additional means of market discipline aimed at reinforcing the ethics of trade supporting digital platforms.

- Facilitating the means for settling disputes, in order to ensure market agents' appropriation of knowledge resulting from innovation.

- Avoid applying SSNIP instruments to the assessment of portals, including evaluation of anticompetitive restraints, and merger investigations, as they are based upon a wrongheaded static/structural market analysis that very likely will backfire if implemented.

- Ensuring that legal barriers created by intellectual property rights do not extend beyond their legal duration or are misused to maintain the incumbent IP holder in possession of the intangible knowledge longer that he is legally authorised.

- Support Intellectual property offices in their endeavors to disseminate a culture of strategic use of intellectual property, as a means to ensure innovators their effective appropriation of knowledge resulting from their activity, thus reinforcing the digital ecosystem.

7. Conclusions

55. Industry leaders are unleashing technology's power by developing new technology platforms. But more than that, it's the platform-based business models and strategies they enable that are driving the most profound global macroeconomic change since the industrial revolution. In the digital economy, platform ecosystems are nothing less than the foundation for new value creation. In light of their impressive growth, these business models will dominate the global economy in the forthcoming years.

56. Trust is the cornerstone of the digital economy and support of online platforms. Without trust, digital businesses cannot use and share the data that underpins their operations. Given that the problem to be solved is how to attain digital trust, competition policymakers should aim their guns at ensuring that no legal impediments thwart the emergence of new digital portals, and that the appropriation of knowledge developed through innovations remains fully in the hands of their legitimate owners.

57. However, the development of policies favoring the development of these models requires previous rejection of the old static/structural paradigms of economic analysis prevailing in the Industrial Economy of the 20th century. In the opening statement of his famous paper "the Nature of the Firm" (1937), Nobel Prizewinner Ronald Coase already lamented that economic theory suffered from a failure to state clearly its assumptions. We now know this had to do with the failure of the mainstream economic thought to consider an alternative dynamic, evolutionary, process-oriented economic world. One could indulge this oversight in the 1930s, as the Walrasian search for "true science" through "methods of natural sciences, and particularly the model of celestial mechanics" was still fresh in the mind of the economists' profession. Today, eighty years later, the buzzword dominating the language of sciences (particularly in physics) is "uncertainty"; hence, one should not expect economic theory to ignore the scientific progress achieved in other disciplines.

58. Addleson (1995) speaks of "two alternative languages of economic theory", or heuristic tools for appraising social phenomena: equilibrium and understanding. The first tool is featured in the neoclassical economic models of perfect competition, whereas the second one belongs to an emerging research program whose goal is to take conceptual hold of evolutionary processes, neglected by the former. The question that needs to be answered before analysing disruptive innovation is under what language this notion may acquire meaning and content.

59. Yet, dismantling old beliefs may not be as easy as it sounds. Thomas Kuhn explained to us the reason for this is to be found in the collegial behavior of the scientists, most of which endorse the conventional paradigm of things for the sake of intellectual comfort. In the case of economists, as seen above, some even defend received wisdom devoid of any supporting empirical evidence. Old habits die hard, they say. Is this why economics is called the "Dismal Science"?

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