Amazon: A story of accumulation through intellectual rentiership and predation.

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Abstract

This article elaborates on the intellectual monopoly theory as a form of predation and rentiership using Amazon as a case study. By analysing Amazon's financial statements, scientific publications and patents we show that Amazon's economic power heavily relies on its systematic innovations and capacity to centralize and analyse customized data that orients its business and innovations. We demonstrate how Amazon's innovation activities have evolved over time with growing importance of technologies related to data and machine learning. We also map Amazon's innovation networks with academic institutions and companies. With reference to intellectual monopoly theory and with focus on predation and rentiership, we show how Amazon appropriates intellectual rents from these networks and from technological cooperation with other intellectual monopolies. We demonstrate that Amazon, as other data-driven monopolies, predates value from suppliers and third-party companies participating in its platform.

One striking characteristic of Amazon is the low rate of reported profits. The centrality of innovations leads us to suggest an alternative calculation that shows that Amazon's profits are not as low as they appear in Annual Reports. We also argue that lower profits are coherent with Amazon's rentiership and predatory strategy since they contribute to avoid excessive market power accusations. Finally, the paper preliminary elaborates on: i) the complementarities between financial and intellectual rentierism, and ii) how data-driven intellectual monopoly expands big corporations' political power. Going beyond the specific case of Amazon, we thus contribute to a better understanding of the role of lead firms and power dynamics within innovation networks.

Keywords

Predation; Economic Power; Innovation; Multinational firms; Intellectual monopoly; Amazon.

JEL Classification: O30; L81; F23

1. Introduction

This article elaborates on the intellectual monopoly theory as a form of predation and rentiership using Amazon as a case study. Intellectual monopolies can be conceptualized as leading global companies that derive a significant share of their profits from intellectual rents (Birch, 2019; Bryan et al., 2017; Durand & Milberg, 2019; Foley, 2013; Pagano, 2014; Schwartz, 2016; Teixeira & Rotta, 2012). While Pagano (2014) defined intellectual monopolies as companies concentrating intellectual property

rights, Durand and Milberg (2019) expanded this concept to include a taxonomy of rents from intangible assets including data-driven rents, inspired by Foley's (2013) concept of informational rents. Building on this expanded conception, we add that intellectual rentiership is enabled by intellectual monopolies' capacity to continuously plan and organize innovation networks from which they capture intellectual rents by predating on the other participants, as well as by establishing technological collaborations with other intellectual monopolies.

Amazon's data-driven intellectual monopoly has changed how markets are conceived (Galloway, 2017). Big retail companies before Amazon analysed consumer trends and data, but they could not individualize them, and available data was limited to purchased goods. Unlike its predecessors, Amazon centralises and processes individualized personal and market data of its customers since its original innovation (book's e-commerce). Customized market data is analysed with artificial intelligence algorithms. The resulting information is used to orient its businesses and innovations. This allowed Amazon to move beyond retail, becoming a multi-product and multi-technology company. Amazon also innovates in storage and distribution, areas that were not typically considered as suitable for technological innovation (Chen et al., 2017). But, as this paper argues, Amazon not only garners intellectual rents from its in-house innovations. It also captures rents from other participants of the innovation networks it organizes, as well as value from the companies participating in its platform and production networks.

Despite its intellectual monopoly and at the odds with the rapid growth in its market value, Amazon's annual reports have systematically shown low profits, with negative net income margins during 2012 and 2014. Since then margins recovered slowly (exceeding net income estimates by the end of 2019) in part due to profits made from its cloud service. In this article we argue that this apparent mismatch between Amazon's intellectual monopoly and historical profits can be in part explained by the way profits are measured, which reflects that this calculation was not conceived for companies heavily relying on intangible assets like Amazon.

Research and Development (R&D) has been historically considered as an expense, thus a cost that should be deducted *before* profits and not as an investment funded *by* profits, which thus should be computed after profits (Corrado et al., 2005; Peters & Taylor, 2017). In companies with heavy investments in R&D, such as intellectual monopolies, this accounting rule greatly reduces declared profits. We can add that, in the case of Amazon, the modest reported profit has protected the corporation from being accused of excessive market power. Keeping profits low may have distracted regulators from looking more closely at Amazon's rentiership and predation.

Yet, this strategy may no longer be enough to hide Amazon's monopolistic power. During CoVid-19 pandemic, changing habits have expanded Amazon's already global businesses (particularly e-commerce). Amazon reported record net sales of $75.5bn for 2020 first quarter (26% increase compared to 2019 first quarter) (Amazon, 2020), while most of the industries are aching, some going bankruptcy and with oil prices reaching negative values.

In order to provide evidence on how Amazon's accumulation strategy is based on its intellectual monopoly, we use cluster analyses to depict both Amazon's innovation networks and its most relevant fields of innovation. For the former we analyse scientific publications looking at Amazon's network of co-authoring institutions and check if these institutions co-own patents with Amazon. For the latter, we perform a semantic analysis of Amazon's patents. This article provides new evidence supporting

the hypothesis that Amazon's hegemony heavily relies on extracting rents from its intellectual monopoly and by establishing predatory relations with companies and research institutions participating in its production and innovation networks.

By analysing the case of Amazon, we also point out consequences for firms not coping with intellectual monopolies' innovation pace, and for research institutions and smaller companies –typically start-ups- that participate in intellectual monopolies' innovation networks. The paper also offers preliminary complementary explanations for Amazon's power[1]: i) the interplay between intellectual rentierism and financialisation and, ii) data-driven monopolies' political power.

The rest of this paper is organized as follows. Next, we elaborate on the emergence of intellectual monopolies, followed by a presentation of our methodology in Section 3. Section 4 provides empirical elements for conceiving Amazon's power as driven by its systematic innovation strategy capturing its own and others' intellectual rents. Section 5 introduces the interplay between financial and intellectual rentierism and the specificities of data-driven intellectual monopolies' political power. Finally, section 6 concludes.

2. The emergence of intellectual monopoly capitalism

Intellectual monopolies spring from the concentration of intangible assets. The OECD (2011) defines the latter as: 'computerized information (such as software and databases); innovative property (such as scientific and nonscientific R&D, copyrights, designs, trademarks); and economic competencies (including brand equity, firm-specific human capital, networks joining people and institutions, organisational know-how that increases enterprise efficiency, and aspects of advertising and marketing)'. This definition, which considers intangibles as knowledge assets, is in line with Veblen's (1908) broader notion of intangible assets as assets without a physical or financial embodiment. According to Birch (2017), considering knowledge as an asset means to transform it into a tradable resource that generates a stream of revenues.

Drawing on Veblen (1908), Baranes (2016) argues that intangible assets provide a right to exclude, generating artificial scarcity. Artificial scarcity triggers an earning to intangible assets' owners in the form of rent, alternatively called intellectual, knowledge or technoscientific rent (Birch, 2019; Durand & Milberg, 2019; Foley, 2013; Kaplinsky, 1998; Pagano, 2014; Teixeira & Rotta, 2012). In other words, these rents emerge from the private appropriation of knowledge and are, as Harvey (2007) puts it, accumulation by dispossession because knowledge's form of property changed from public or common to private. In this vein, Teixeira and Rotta (2012) state that knowledge privatization is a new form of 'enclosure' that deprives labour of knowledge as a means of production.

In general, authors looking at these forms of rents focus on legal monopolies that spring from intellectual property rights (Pagano, 2014; Pistor, 2019; Teixeira & Rotta, 2012). However, artificial scarcity is not exclusively created by law with copyright, trademarks or patents, but is also generated when knowledge is kept as industrial secret or tacit. To capture these different forms of intangible

[1] Drawing on Strange's (1996, p. 17) broad concept of power as "the ability of a person or group of persons so to affect outcomes that their preferences take precedence over the preferences of others", the general concept of power mobilized here refers to a corporation's capacity to influence the outcomes of its industry's capital turnover and innovation processes in its own favour, over the preferences of other corporations, research institutions and the workers of that industry.

assets' concentration, Durand and Milberg (2019) proposed a taxonomy of rents from intangible assets that goes beyond legal ownership. We will come back to these forms of rents next.

2.1. From tangible capital concentration to intellectual monopolies.

Intellectual monopolies can be further conceptualized by briefly referring to previous political economy perspectives on monopolies. Monopolies, in Baran and Sweezy's (1966) time, were conglomerates that concentrated and centralized (tangible) capital. Concentration referred to vertical integration whereas centralization pointed to horizontal integration by merging with or acquiring rival companies. Unlike these monopolies, whose advantages were related to the size of their tangible capital[2], intellectual monopolies concentrate intangible assets, while deconcentrating tangible ones. Outsourcing can be conceived, thus, as reversing tangible capital concentration, although it did not affect centralization and it did not eliminate monopolies. Durand and Milberg (2019) explain that Global Value Chain (GVC) leaders have developed exclusive know-how when it comes to integrate the chain and its complementarities, which triggers intangible rents. GVC leaders can thus be conceived as a special type of intellectual monopoly; they have monopolized the know-who (B. Johnson & Lundvall, 1994) in the supply chain. They have exclusive knowledge covering the whole chain and thus the capacity to integrate it, assuring network complementarities.

Empirical evidence shows that leading global companies profit from deconcentrating tangible capital (Contractor et al., 2010; Milberg & Winkler, 2013; Smith, 2016; Sturgeon, 2009). By reducing capital commitment, they reduce associated risks (such as losses due to demand fluctuations, discontinuities in capital turnover and costs associated with technical change, labour legislations and future workers' demands). These risks are carried over to subordinated enterprises. The result is not that leaders will become smaller and smaller. They remain big and become even bigger due to mergers and acquisitions (M&As) (Serfati, 2008). In line with Harvey's (2002) assessment, monopoly power is reinforced by a twofold process: capital centralization (due to M&As) and the reinforcement of intangibles' assetization.

A firm's capacity to transform knowledge into assets and thus harvest intellectual rents does not only depend on internally produced knowledge. Outsourcing is a viable strategy also for innovation leading to the organization of global innovation networks (Ernst, 2008, 2009; Parrilli et al., 2013). Hence, intellectual rents may be extended on the basis of knowledge on how to organize and plan innovation networks, including knowledge on who has greater chances of accomplishing breakthroughs at each step. An example of the latter is big pharma's outsourcing of research functions (Abecassis & Coutinet, 2006; Baranes, 2016; Danzon et al., 2005; Lane, 2007; Rikap, 2019). By outsourcing knowledge modules, they reduce associated risks while they keep the exclusive ownership of successful results (i.e. intellectual rents). In this article, we will show that this is also the case of Amazon.

Another source of intangible rents in Durand and Milberg's (2019) typology are legal intellectual property rents. Pistor (2019) notes that almost 90% of the patents granted by the United States Patent and Trademark Office between 2002 and 2015 were assigned to corporations, which for the author indicates that patents are more related to commercial use than to gratifying creativity. Big

[2] "Internal expansion, acquisition, and merger are the ways in which corporations grow, and growth is the road to size. Thus profits, even though not the ultimate goal, are the necessary means to all ultimate goals." (Baran & Sweezy, 1966, pp. 39–40)

pharmaceuticals are a paradigmatic example of the latter. Their M&As are greatly explained by their quest to enlarge such legal monopoly rents, while they limit rivals and distribute greater value to shareholders in the short-term (Montalban & Sakinç, 2013).

The growing importance of legal intellectual property rents has been favoured by the international strengthening of Intellectual Property Rights (IPRs), which formally began in 1995 with the Trade Related Aspects of Intellectual Property Rights (TRIPS) agreement. For Dreyfuss and Frankel (2014, p. 459), TRIPS not only meant a step towards international law-making for intellectual property. It was also a shift in how intellectual property was conceived, from barrier to trade -as it was considered in the General Agreement on Tariffs and Trade- to become 'a tradable commodity in the name of facilitating trade'. TRIPS was followed by a set of free trade agreements, bilateral investment treaties and regional pacts that transformed intellectual property into an investment asset, emphasizing the 'property' rhetoric. Among other changes, this allowed patent holders to demand arbitrations at the international level, which until then was a states' dispute that took place at the World Trade Organisation (Dreyfuss & Frankel, 2014).

On top of these forms of intellectual monopoly, Amazon will be conceived in this paper as an example of a data-driven intellectual monopoly. Data-driven or informational rents arise from the centralization of the constant flows of new data which enhances innovation capabilities (Durand & Milberg, 2019; Foley, 2013). Data on their own are not enough to raise entry barriers and thus gain market power (Nuccio & Guerzoni, 2019). Data must be processed in such a way that it triggers multiple successive innovations which reinforce entry barriers. This is what Amazon has done: by centralizing and processing big data with innovative artificial intelligence algorithms, Amazon has triggered data-driven intangible rents which are, as Durand and Milberg (2019) pointed out, *dynamic innovation rents*. As the name implies, these rents rely on a source of innovation that keeps developing throughout time.

Amazon's algorithms are a key advantage not only for increasing sales by tailoring supply to consumers' needs, but also for developing the capacity to provide such an offer. Amazon anticipates fashion and tastes, and even creates new needs thus lowering innovations' associated risks. We may say that Amazon's investments in intangibles rely on its role as a sort of (in)visible hand that to some degree overcomes capitalism's anarchy and decentralization.[3]

Although big companies, historically, have used different mechanisms to anticipate demand, market clearance could not be anticipated.[4] Companies selling consumer data provided insightful information, but consumers can (actually do) lie when replying to surveys, their scope is limited and costs high. Additionally, it was not possible to track individual consumer patterns. Amazon has overcome these constraints and can customize demand with much greater accuracy.

Amazon may thus be seen as a compelling representation of markets' visible hand. It anticipates individual demand and manipulates supply. Even when Amazon is not the supplier, it requires third-party sellers to offer at the lowest prices and it also defines which commodities will appear first when

[3] Besides Amazon's power to assure sales beforehand, micro-publicity or targeted advertising, which is the main business of Google and Facebook, is another low hanging fruit to be harvest from its data. Indeed, Amazon advertises its own and others' products in our email accounts every day as well as on its platform. Try buying running shoes at amazon.com and you will receive suggestions on sportswear.

[4] See for instance https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/inside-p-and-ampgs-digital-revolution on how Procter & Gamble received consumer comments before big data revolution and on the limitations of customer panels.

a consumer searches in its marketplace. This capacity led to an unprecedented example during the first weeks of the global lockdown due to CoVid-19. Amazon suspended non-essential items' sales due to an unexpected explosion in e-commerce (Mattioli, 2020a). Very quickly, however, Amazon, responded to this unexpected shock hiring additional 175,000 workers for its fulfilment and delivery network.

Overall, instead of a process where markets clear according to the spontaneous interaction of supply and demand (the invisible hand), Amazon's actions contribute to markets clearance. Moreover, elaborating on Dolata (2017) Amazon (as well as other high-tech giants) has a rule setting power exercised on individuals as well as on the companies that participate in its production and innovation networks.

Hence, Amazon (as other data-driven intellectual monopolies) goes beyond Chandler's (1993) visible hand because it controls both supply and demand, whereas the Chandlerian firm exercised a visible hand role from the supply side. Moreover, data-driven intellectual monopolies are visible hands without vertical integration. The Chandlerian firm became a visible hand of the market by becoming a vertically integrated business of multiple business units. By centralizing and concentrating capital, managers and not the market allocated resources in what before had been separate businesses. In contrast, Amazon and other high-tech companies can allocate and coordinate resources beyond the tangible and intangible capital they own.

All in all, intellectual monopoly expands on the basis of multiple sources of intellectual rents. The next section considers the results of this process in terms of greater inequalities. We will argue that intellectual monopoly rents reflect a redistribution of value based on predatory relations. Further, unequal exchanges between firms will have differential effects on their workers.

2.2 Firms' differentiation according to their capacity to monopolize intangible assets and intellectual monopoly predatory practices.

When a company accumulates intangible assets, it establishes an entry barrier. But entry barriers may be porous (Kurz, 2017; Moudud, 2013). Other firms (both incumbents and entrants) will try to overcome them by transforming other knowledge into assets that could pass over their rivals' knowledge advantage. Nevertheless, the same firm that accumulated intangibles in the first place could reinforce its entry barrier by introducing the next breakthroughs. A long-term stream of greater intellectual rents will result (Rikap, 2018). Given that knowledge is a cumulative process with economies of scale and that it requires minimum knowledge thresholds to allow copies, the overall result of knowledge assetization could actually become a cumulative causation process (Antonelli, 1999; Dosi, 1988). Companies that accumulated intangibles first within an industry, will be in a better position to keep appropriating intellectual rents in the long-term. In Pagano's (2014, p. 1423) terms, firms with greater 'intellectual endowments will continue to do (possibly increasingly) better than those lacking this monopoly power'.

Seen in this perspective, firms' differentiation springs from differences in their capacity to transform knowledge into assets. In line with Nuccio and Guerzoni's (2019) conclusion, systematic investment in R&D –or more precisely the capacity to invest in intangibles and capture associated rents from innovation networks- sustains entry barriers perpetuating intellectual monopolies. The other side of

this process is that subordinated companies lose their technical autonomy and depend on intellectual monopolies' intangible assets. This dependence allows the latter to define exchange and production conditions of the former as a direct relation of appropriation of part of the value produced in subordinated firms.

Veblen (2017) conceptualized predation as a direct manifestation of superior force. Mobilizing this concept in the intellectual monopoly context, we reconceive predation as a direct production relation of spoliation where an individual capital exercises its superiority by planning the activities of other individual capitals and institutions. Each intellectual monopoly plans and organizes production and innovation networks capturing the biggest share of produced surplus value. The capacity of leaders to appropriate value from production networks is widely recognized within Global Value Chains and Global Production Networks literature (Bergvall-Kareborn & Howcroft, 2013; Kraemer et al., 2011; Selwyn, 2019; Smith, 2016). We contribute to this literature acknowledging that predation also takes place within innovation networks dominated by intellectual monopolies.

Intangibles are being appropriated by intellectual monopolies at the expense of the creative capacities of the other participants of these networks (other firms and research institutions). Even consumers/customers may contribute, for instance when they freely test resulting innovations such as new Amazon Web Services' (AWS) features. Furthermore, national states are often risk-takers. They have been major R&D investors especially of radical and path-breaking innovations without enjoying their associated profits (Barringer & Slaughter, 2016; Mazzucato, 2015, Chapter 3).

We have pointed out that the know-who advantage of intellectual monopolies over their supply chains may also be extended to their capacity to organize and plan innovation networks (Ernst, 2009; Liu et al., 2013). A Deloitte's report claimed that leader companies constantly plan the overall innovation process and stimulate other companies to do so by introducing digital supply networks (Mussomeli et al., 2016). Yet, this capacity to plan and organize innovation networks cannot be emulated by subordinate companies. Intellectual monopolies define general orientations and desired results within the innovation networks they organize, of course without being able to anticipate every step and leaving degrees of autonomy to other participants.

Outsourcing knowledge modules may be a risk for the intellectual monopoly because results could end up being appropriated by other actors. From a dynamic perspective and in abstract terms, it may be argued that as an intellectual monopoly grows stronger, its chances to outsource knowledge modules and garner resulting rents will be higher, which further reduces subordinate companies' chances to overcome subordination. We may thus distinguish between two stages in the formation of an intellectual monopoly.

The first stage may be triggered by a blockbuster idea[5] of a company that has the internal means to accomplish it, considering the knowledge capacities of every subsidiary if it is a multinational enterprise.[6] If successful, on the basis of that breakthrough and considering knowledge's cumulative

[5] The term blockbuster is generally used for films and books, to indicate a great commercial success. It has also been widely used to refer to drugs producing at least $1 billion in sales a year for its manufacturing companies. We use the term to refer to an innovation that will lead to a great commercial success.

[6] Research can take place in multiple locations, divided into different knowledge modules inside the multinational. Drawing on Park and Mense-Petermann (2014), this process will be favoured by expatriated managers -who moved from headquarters to subsidiaries- given their role in knowledge exchange and global integration of the company.

causation, it may be expected that this company will try to further innovate, again relying on its internal capabilities, before other companies catch-up. If successful, intellectual rents remain. They are a redistribution of value at the economic system's level; a process that takes place through market exchanges and without a direct production relation of spoliation. Summing up, stage 1 corresponds to an intellectual monopoly that is a rent-seeker but does not predate on other actors.

Next, it is possible to think of a second stage that corresponds to a settled intellectual monopoly. In this case, it can outsource innovation modules. New potential ideas for innovations may come from any of the participating actors in the innovation networks, but the intellectual monopoly will organize and plan them in such a way that it can garner most of the associated intellectual rents. Overall, in stage 2 it collects rents from the assetization of its own knowledge but also from the creative/innovative activities of others. This leads to a reinforcing dynamic between overall rentiership and predation from its innovation networks. In stage 2, part of the garnered rents results from a direct production relation of spoliation between the intellectual monopoly and the other participants of its innovation networks.

This process is in line with Dreyfuss and Frankel's (2014) analysis of the evolution of international intellectual property legislation. From a narrative based on rewarding the creator, they explain that legislations moved towards a discourse where the owner of the patent became the main actor. This implicitly recognizes that the owner may not be the creator and relegates the place of the latter.

Finally, in stage 2, the choices between 1) outsourcing or contributing to collaborative R&D environments, and 2) in-house investment in intangibles' production depend on the nature of the intangible. For instance, infrastructural innovations that are not specific to a single intellectual monopoly, will be more prone to outsourcing or even conducted together with other intellectual monopolies.

Summing up, each intellectual monopoly extracts rents not only from its in-house creative projects but also from the achievements of all the organizations participating in its innovation networks, garnering rents through a predatory relationship. After presenting our chosen methodology, the rest of the paper will argue that Amazon's power relies on its inception as an intellectual monopoly, including these predatory practices.

3. Methodology

In order to analyse Amazon's accumulation strategy as an intellectual monopoly, we consider different sources of information as well as secondary sources such as web pages, mass media, and company annual reports. We make use of three different databases. We use *Compustat* for historical data on R&D investments, net sales and net income. We retrieve information on every scientific publication authored by Amazon or any of its subsidiaries until 2018 included from *Web of Science*, and its granted patents from 1996 (first year with data) until February 2018 from *Derwent Innovation*[7].

Besides descriptive statistics, the main empirical method we use to study Amazon as an intellectual monopoly is network analysis. To that end, publications and patent data were processed with CorText

[7] Our access to this database included the following patent offices: USPTO, WIPO, European, Japan, Australian, British, Canadian, French, German, Russian and Korean patent offices.

platform which allows building co-occurrence maps.[8] For these maps, we used specific proximity algorithms that associate entities (terms for the semantic analysis of Amazon's patents and research institutions for Amazon's publications network) according to the frequency of their co-occurrence within a corpus of texts (Barbier et al., 2012). The procedure used to draw these maps, including our corpuses cleaning, follows Tancoigne et al (2014). Resulting maps depict a series of interconnected clusters. Entities are grouped in clusters according to their co-occurrence frequency.

To analyse the content of Amazon's patents we first conducted a lexical analysis of the abstracts and titles of its retrieved patent portfolio. We extracted the 1000 most frequent phrases of up to 6 terms. The term extraction algorithm provided by CorText recognizes similar phrases (such as 'data stored' and 'store data') and associates them to the same multi-term. Monograms were excluded to avoid words whose frequency responds to their grammatical function ("and", "or", etc.). The list was also refined to avoid phrases not related to the field and whose frequency responds to the level of grammaticalization within the innovation genre (such as "present invention", "preferred embodiment", "other uses", "subject matter", etc.). The refined list contained 901 terms. Next, a series of network maps were built by splitting the total patent corpus into different time periods to see the evolution of Amazon's patented technologies. In each case, network maps depict the top 100 phrases in terms of their frequency of co-occurrence within each period's corpus. We looked at the maps that resulted from splitting the corpus into 2, 3 and 4 periods and chose a three-period network mapping evolution. Splitting the corpus into two periods led to ignore breaks in privileged topics, and a four-period mapping did not add significant information on Amazon's patent content evolution. Since Amazon was granted only 2 patents in 1996 and has no patents for 1997, the first period goes from 1996 to 2004, and the following two periods are 2005-2011 and 2012-Feb 2018.

The resulting network maps (in Appendix) depict clusters of most frequently connected phrases in each subperiod. Each cluster could thus be interpreted as referring to a specific technology or research priority (or to a set of closely interrelated technologies or research priorities). We chose a distributional metric for determining nodes proximity that accounts for the global distribution of co-occurrences of each pair of nodes with all the other nodes.

To provide a clearer sense of topics' evolution within Amazon's patent portfolio, we include a "tubes layout" (Figure 4 in section 4) that is automatically generated by CorText for dynamic network mappings. It is called tubes because clusters' evolution is traced by connecting related clusters from different periods with a tube. This layout provides a simplified depiction of clusters' evolution over the three chosen periods. Clusters are represented as rectangles, are identified by their most frequent terms, and are placed in the year corresponding to the midpoint of each period. Tubes layout will show how clusters connect with each other between periods. Two or more clusters may merge into one, a cluster can split into multiple clusters, and the same cluster may show a continuation or end at some point in time. The width of the tubes that connects different clusters is proportional to their number of records. Since Amazon's patenting activity accelerates in time, plotted tubes widen in the last period. The colour of the tubes provides evidence on the degree of similarity between two connected clusters. Darker tubes are more robust in the sense that more nodes are shared between the connected clusters in two consecutive time periods.

[8] CorText is an open platform for performing bibliometric and semantic analysis that uses the spatial algorithms that draw on classic graph visualisation methods for depicting the network maps (Fruchterman–Reingold). It can be accessed online at https://www.cortext.net/

The same technique was applied to build Amazon's co-authorship network (Figure 5 in section 4). We consider it as a proxy of its innovation networks. Social network analysis using co-patenting and co-publication data allows mapping relations between actors within such networks (Wasserman and Faust, 1994). In Amazon's co-authorship network map, nodes represent authors' affiliations (universities, firms, etc.) and their sizes represent those institutions' co-authorship frequency with Amazon. To focus on Amazon's privileged partners, we plotted a network map with the top 50 affiliations (Amazon plus its top 49 partnering organizations). They are the organizations most frequently connected to Amazon (including its subsidiary companies).

To build this network map a chi-square (hereon chi^2) metric was preferred. This is a direct local measure, meaning that it considers actual co-occurrences between entities. Indirect measures like the distributional one should not be applied in this case because we are looking for actual links and not for similarity of two nodes based on their entire co-occurrence profile with the other identified entities (Tancoigne et al., 2014, p. 40). Chi2 metric constructs clusters by focusing on the most frequent partners -thus privileging established innovation networks over occasional links. Co-authorships are depicted as direct but also indirect links. The latter is the case of co-authorship between two institutions that share publications but always co-authoring with a third institution that also authors publications with any or both of them. Hence, in the network this third institution appears in between, connecting the other two. Since we are looking at Amazon's publications, we already know that every depicted institution authored papers with Amazon. Hence, indirect links will show which are the institutions whose publications with Amazon always had the same third institution as co-author. This third institution is a bridge institution, it connects Amazon with other institutions.

An alternative to chi2 metrics could have been to use raw metrics. We would have thus considered the raw numbers of co-occurrences between every possible pair of nodes and shown every link above a selected threshold (Z. Wu & Leahy, 1993). The limitation of raw metrics is that it does not privilege any type of link. Hence, since every publication is published by Amazon, the resulting map would show a very dense network where every institution is linked to Amazon, also showing other links between institutions for papers authored by more than two research institutions. The excess of data will thus limit the analysis. By using chi2, we look at privileged links within the network, thus we will be able to identify which organizations play a key bridging role and which participate in Amazon's innovation networks introduced by those bridge organizations.

Finally, to provide evidence on how Amazon is garnering intellectual rents from its co-authors, predating from organizations participating in its innovation networks, we compare its patent portfolio co-ownerships with the co-authorship network map. In the next section, we present our main findings together with further conceptualizations of Amazon's accumulation strategy as an intellectual monopoly that harvests rents from its own R&D as well as from its innovation networks.

4. Amazon's intellectual monopoly

In this section, we argue that Amazon's accumulation strategy and economic power are based on its intellectual monopoly. To that end, we begin by looking at Amazon's R&D[9] and patents evolution, as

[9] Amazon informs R&D expenditures within "technology and content" which includes most of the costs to operate AWS including servers, networking equipment and datacenter depreciation. All the latter should be considered as investments,

proxies to innovations input and output. Given the steep evolution of the former and considering R&D as an investment aiming to produce intangible capital, we reconceptualize Amazon's margins considering R&D as an investment instead of an operating expense. Next, we further elaborate on Amazon's intellectual monopoly by looking at the content of its patents over time in section 4.1. The importance of data for Amazon's intellectual monopoly is acknowledged and conceptualized. Sections 4.2 and 4.3 analyse how Amazon predates from its production and innovation networks.

As explained by Shelanski (2013, p. 1685), for companies like Amazon, R&D is indistinguishable from the production process. In the case of Amazon, letters to shareholders emphasize innovation's importance:

> We want to be a large company that's also an invention machine. We want to combine the extraordinary customer-serving capabilities that are enabled by size with the speed of movement, nimbleness, and risk acceptance mentality normally associated with entrepreneurial start-ups (Amazon, 2016, p. 6).
>
> We expect spending in technology and content will increase over time as we add computer scientists, designers, software and hardware engineers, and merchandising employees. Our technology and content investment and capital spending projects often support a variety of product and service offerings due to geographic expansion and the cross-functionality of our systems and operations. We seek to invest efficiently in several areas of technology and content, including AWS, and expansion of new and existing product categories and service offerings, as well as in technology infrastructure to enhance the customer experience and improve our process efficiencies. (Amazon, 2018, p. 30).

In line with this narrative, Amazon has systematically increased its "Technology and Content" investment (which primarily includes R&D investment) over net sales since 2010, going from 5 to 12% in 5 years (Figure 1).[10] In 2017, Amazon was the company that invested the most in R&D worldwide.[11] In 2018 this figure decreases marginally but this is explained, as we show next, by a sharp increase in Amazon's net sales (31% in one year) that partially offset its 27.5% increase in "Technology and Content". Amazon also impressively grew its patent portfolio (Figure 2).[12] Beyond Amazon's experience, these stylized facts are in line with general empirical evidence that underlines that intangible assets are increasingly becoming more important than tangible ones (Chen et al., 2017; Crouzet & Eberly, 2018; Haskel & Westlake, 2018) and, in particular for explaining GVC dynamics (Durand & Milberg, 2019; Gereffi, 2014).

Figure 1. Amazon's "Technology and Content" (R&D plus other expenses) over net sales.

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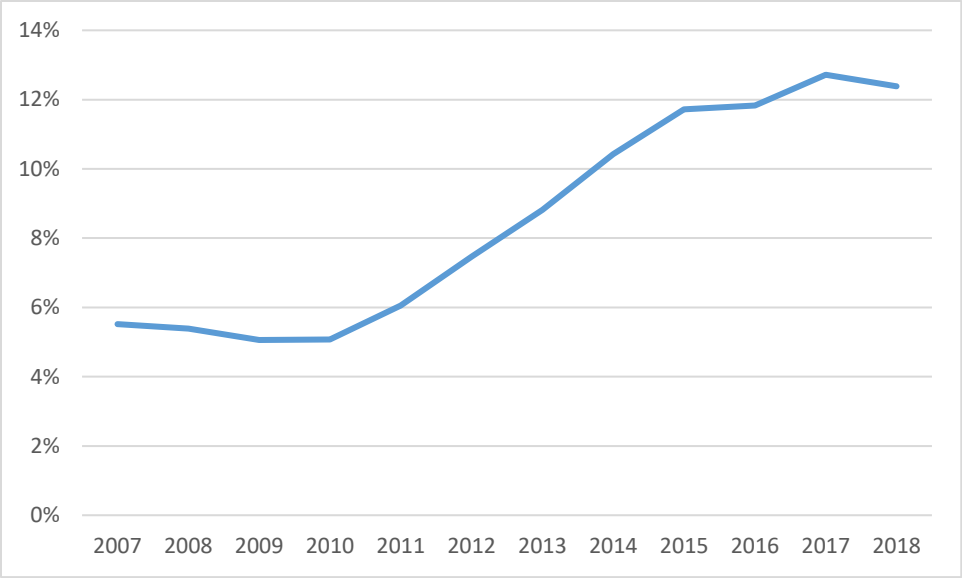
thus further reinforcing our argument of this variable as an investment and not an expense. Amazon states that increases in "technology and content" in 2017 and 2018 compared to previous years is mostly explained by R&D spending "on technology infrastructure and increased payroll and related costs associated with technical teams responsible for expanding our existing products and services and initiatives to introduce new products and service offerings" (Amazon, 2019, p. 26).

[10] Whilst these figures are impressive, a caveat must be stated. Around 10% of Amazon's investment in R&D is stock-based compensation expenses paid to employees from their technology and content departments who receive around 50% of total stock-based compensations paid by Amazon to its employees (Amazon, 2019).

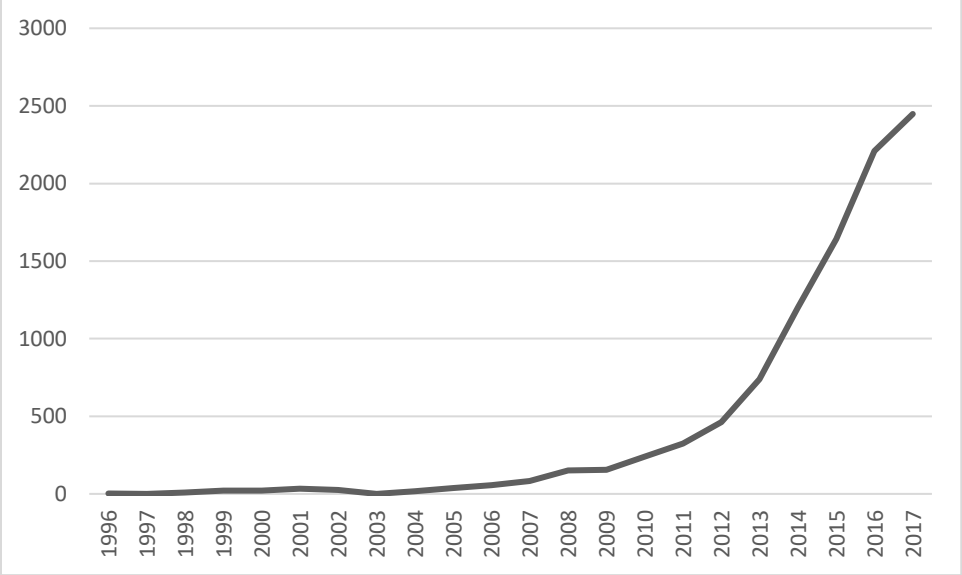
[11] Retrieved from: https://www.statista.com/statistics/265645/ranking-of-the-20-companies-with-the-highest-spending-on-research-and-development/ last access February 28, 2019.

[12] Granted patents evolution in the ICT sector is a partial (though to some extent compelling) depiction of a corporation's innovativeness since multiple innovations scape from patents or do not require or cannot be patented. Furthermore, while only one patent –if protecting a break-through innovation- can yield colossal rents, a thousand patents may generate no gain at all.



Source: Compustat

Figure 2. Amazon's Granted Patents (source: Derwent Innovation)



Source: Derwent Innovation

The relevance of intangible assets leads to reconceive R&D as an investment rather than as an expense[13] (Corrado et al., 2005; Peters & Taylor, 2017). Figure 3 depicts Amazon's margin rate with and without R&D investments discounted from its net income. Margins are always positive when we reconsider "Technology and Content" as an intangible (productive) investment. Moreover, the gap between the two margin rates widens, showing how the growing relevance of R&D contributes to explain Amazon's historically flat and low or negative margins. In other words, the fact that Amazon's

[13] Unlike the US Bureau of Economic Analysis that since 2013 classifies R&D spending and the development of intellectual property as an investment in national accounts, at the firm level R&D is still considered as an operating expense (Mason, 2015). This is evidenced in Amazon's annual reports.

margin with R&D as an expense remains flat and even increases recently is a sign of Amazon's profitability. 2018 figures provide further proof of the latter. Net sales and net income keep growing but the same is true of R&D investments, thus evidencing their productive nature and how Amazon's accumulation strategy cannot be understood detached from those investments.

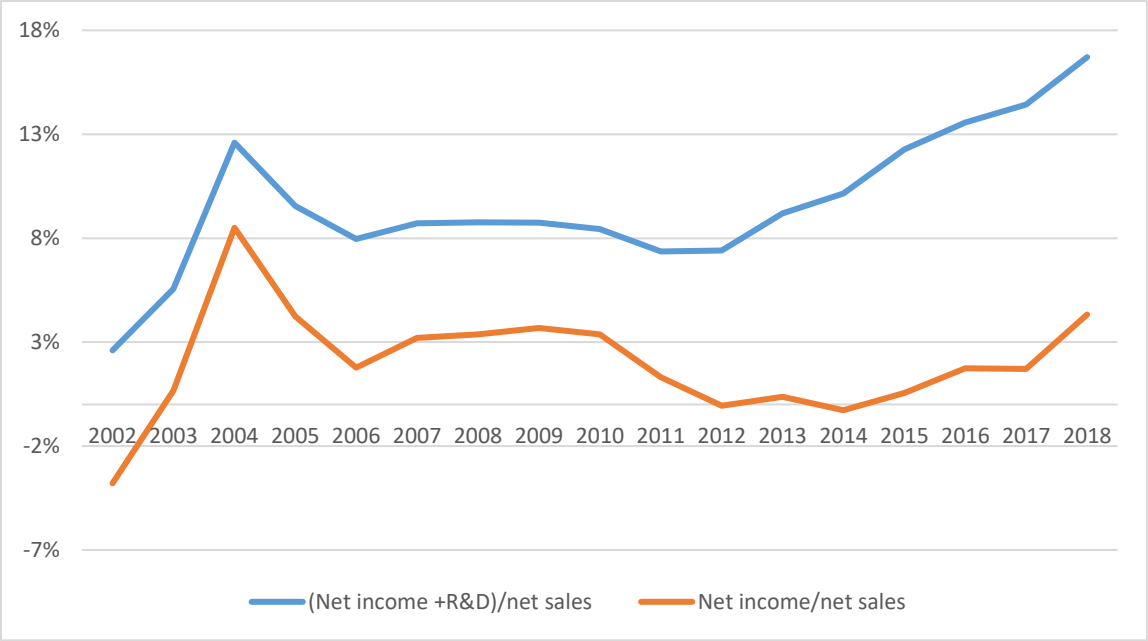
In addition, as far as R&D is not reclassified as an investment, net income figures will be misleading and will contribute to disguise Amazon's monopoly because it would be seen as a company that even with high and growing market shares[14] is not profiting at a similar pace. Summing up, low margins when considering R&D as an expense could be indicating that Amazon invests as much as it can in R&D and possibly that the company prefers to keep a low profile. The most recent example of its low profile strategy can be found in its 2020 First Quarter Results. Regardless of record net sales in the first three months of 2020 and considering the still exponential trend in e-commerce and cloud computing given global lockdowns, Amazon anticipated that 2020 second quarter results may even exhibit an operating loss explained by an expected additional $4bn in costs related to keep workers healthy and products delivered (Amazon, 2020). Reporting low margins may be seen as an attempt to draw less attention from regulators. Indeed, until recently, Amazon managed to avoid being accused of excessive market power. Low prices contribute to draw less attention from regulators as we further explain in section 4.2.

Summing up, this alternative calculation shows that Amazon's profits are not as low, thus contributing to explain the evolution of Amazon's stocks. Amazon was the second company of the world in market value during most of 2018 -even the first one on December 3rd when it passed over Apple (Jiang, 2018)- and remained in top 3 during 2019. Nonetheless, this evolution may also be reflecting over-valued stocks due to shareholders' positive expectations about Amazon's future, which in part depends on its intangible assets' future valuations.[15]

Figure 3. Alternative margin rates for Amazon.

[14] Before CoVid-19 pandemic Amazon had almost 40% share of online retail activity and more than a third of the cloud computing market (Synergy Research Group, 2019; UNCTAD, 2019).

[15] Haskel and Westlake (2018) identify different studies that found strong positive correlations between proxies of intangible assets' accumulation and market value at the company level. Given the uncertain nature of knowledge on which those assets rely, the accuracy of their valuation will be, to say the least, highly variable potentially leading to over-valued stocks and thus to intangible assets' bubbles. Elaborating on this remark, as far as it is expected that a company will keep its intellectual monopoly, its stock market valuation will -ceteris paribus- tend to rise since that monopoly is based on a continuous accumulation of intangible assets which, as stated by Durand and Milberg (2019), often have never-ending economies of scale.



Source: Compustat

Overall, the data illustrates that innovation is paramount for Amazon. We elaborate next on the dynamics that incepted Amazon as an intellectual monopoly.

4.1. The inception of Amazon as an intellectual monopoly

As well as other tech giants, Amazon has monopolized innovation at the market sphere, changing how markets are conceived and becoming a data-driven intellectual monopoly. Since its original innovation (books' e-commerce[16]), Amazon acquired rich access to customized market data. Continuously gathered data can easily be aggregated and individualized performing multiple analyses simultaneously (Fourcade & Healy, 2016). Information is priceless for further innovating, as evidenced by Amazon's experience.

Amazon has information on what each consumer wants (where, what and how each consumer thinks of buying) and what suppliers and third-party sellers can offer and at what prices. Furthermore, Amazon can match consumer habits with personal information (past and present addresses, age, history of purchased goods, etc.). It has even been claimed that Amazon discriminates prices using customers' previously gathered data (Kahn, 2017). If this were the case, Amazon's twofold capacity to individualize consumers and charge them different prices based on its personalized knowledge of these individuals' information could also be seen as a predatory behaviour where Amazon -closer to the ideal version of a perfect price discriminator- directly sets prices for each consumer.

Amazon also gathers data from third-party sellers which are frequently its rivals (Mattioli, 2020b).[17] Amazon uses this data to detect potential businesses (Galloway, 2017), while transferring the risks of new product failures to rival companies (Bensinger, 2012). Amazon Web Services (AWS) is another

[16] This was coupled with multiple cost-saving innovations such as encouraging consumers to review the books they buy (which later expanded to every sold commodity). Amazon saves the costs of hiring advisors that could reply to potential consumers' inquiries.

[17] Such as Sonos smart speakers' case (Feiner, 2019)..

source of data for Amazon. AWS provides indispensable infrastructure -digital analysis and assistance- enabling other companies including General Electric, Mc Donald's and Netflix, governments and institutions to outsource their web services.[18] Thus, it helps to detect businesses whose consumption of web services suddenly bumped. This provides hints on promising businesses and technologies such as start-ups like Yieldex, Sonian, Engine Yard and Animoto, all of which received Amazon seed money and could eventually be acquired (Barr, 2011). If they refuse to sell, Amazon may copy them, offering substitute products at a lower price[19] until the start-up goes bankrupt or sells the business to Amazon, as it did with Quidsi and its baby care e-commerce business (Kahn, 2017).

Throughout its history, Amazon diversified its business based on gathered data and an equally diverse innovation portfolio. Annual reports present detailed lists including every type of innovation: product (Kindle, Alexa, Amazon Web Services, etc.), process (optimizing shipments and storage by using drones and robots) and market creation, such as initiating operations in different (new) countries.

Even if innovations cannot be reduced to patents, by analysing the content of the latter we can provide an overview of Amazon's diversified innovation portfolio. Figure 4 plots a tubes layout that results from a semantic analysis of the titles and abstracts of Amazon's patents. It summarizes three network maps corresponding to three sub-periods within our analysed time frame (see Figures A.1, A.2 and A.3 in Appendix). While network maps plot Amazon's patent content in greater detail, they remain as separate shots of Amazon's granted patents content in different moments in time. On the contrary, Figure 4 plots the evolution of Amazon's patent portfolio in a simplified way. It tags each cluster with its two most frequent terms (thus those that may refer to the most relevant technology or aspect of the technology that corresponds to this cluster) and shows how clusters evolve.

Figure 4. Amazon's patents semantic analysis.

[18] Cloud services also contribute to further develop global outsourcing trends and, as pointed out by Klinger-Vidra (2016), reduce the venture capital needed by start-up companies by extremely reducing the costs of software development.

[19] As Google and Amazon did with Sonos speakers (Nicas & Wakabayashi, 2020).

Source: Author's analysis based on Derwent Innovation data extraction.

Tubes layout highlights breaks between periods. There are only a few connections between single clusters from one period to the next. The single cluster that appears in every period refers to its search engine and queries for user interfaces. These inventions are at the core and origin of Amazon's data-driven intellectual monopoly. In general, not only new clusters keep emerging, but also those that show continuations tend to be light in colour, providing evidence of clusters' internal heterogeneity between periods. This can be interpreted as proof of Amazon's evolving multi-technologies, in particular for data-related patents which present the lightest tube. Our analysis of each period's network map reinforces this finding.

The first period goes until 2004 (figure A.1 in Appendix) and corresponds to innovations related to Amazon's original business: a marketplace with search engines capable of finding what people are looking for and make users targeted recommendations. Amazon continued innovating in these areas in the second period (2005 to 2011) (see Figure A.2 in Appendix). Nevertheless, in this period Amazon's patent portfolio starts to diversify. Granted patents included inventions related to advertisement in its marketplace, different technologies that are at the basis of the Kindle, and innovations related to inventories using machine learning technologies (Ackerman, 2018; Pooler, 2017). Inventory and warehouse related inventions continued in the third period (2012 to 2018) (see Figure A.3 in Appendix). Amazon uses drones for delivering packages and has a huge fleet of robots in its fulfilment centres (Brown, 2018). All these innovations contribute to achieving economies of scale.

The second period also corresponds to the time when most of the patents related to the term 'web services' were granted to Amazon (evidenced by the size of its node in the corresponding network map). In the third period this term preserves its key connecting position.

In the first two periods, terms related to data (storage, analysis, etc.) are to some extent dispersed and mixed with general terms related to computing inventions. Anyway, the centrality of 'data' is evidenced by the number of multi-terms containing that word (70 in the 901 most frequent terms used

in this semantic analysis) as well as by a cluster focused on data storage in the third period, which is at least partly related to AWS.[20] The evolution of patents containing frequent terms that include the word 'data' soared in time, from an average of 2.2 patents granted per year from 1998 to 2007, it reached 312 granted patents in 2017 (see table A.1 in Appendix). This is a clear sign of the interlinks between data and innovation for Amazon, pointing to the complementarities of two of Durand and Milberg's (2019) proposed types of rents: data-driven intellectual rents and legal monopolies. Concerning technologies for developing AWS, in the 3rd analysed period the term "web services" keeps its bridging role.

The most recent period shows a further diversification of Amazon's technologies which is accompanied by the growing importance of user inputs and interfaces, and data management (including data storage). New technologies broadening Amazon's intellectual monopoly concentrate around industry 4.0, in particular terms related to machine learning. Finally, among the most frequent terms of this last period, we find 'media content', which could refer to Amazon's new businesses, in this case media production and streaming.

The aforementioned capacity to collect and process market data should not lead us to think that Amazon's innovations will never fail. Since becoming an intellectual monopoly relies on constant innovations, it demands a great capacity to overcome failures that are intrinsic to innovation processes. In Amazon's founder -Jeff Bezos- own words 'failure and invention are inseparable twins. To invent you have to experiment, and if you know in advance that it's going to work, it's not an experiment.' (Amazon, 2016, p. 2). Amazon has a great capacity to recover from failures, such as the Fire phone, Amazon Local –that tried to compete with Groupon but shut down in 2015- and drugstore.com sold to Walgreens in 2011 (Masters, 2018). This recovery capacity springs from intellectual monopolies' greater chances to divert failures to subordinate firms. Predatory behaviour also contributes to compensate circumstantial failures, as we argue next for Amazon.

4.2. Amazon's platform and production networks: using its intellectual monopoly to predate from subordinate firms.

Data-driven intellectual monopolies, and more generally intellectual monopolies, not only capture value by acquiring or entering the successful or promising businesses of their complementors (Lan et al., 2019; Zhu & Liu, 2018), but also by unequally exchanging with them and with value chain suppliers. Subordination is the best alternative for third-party sellers and suppliers because of the colossal size of Amazon's marketplace.

Amazon's pricing strategy is aligned with its predatory behaviour, lowering prices below rival companies (Kahn, 2017; Stone, 2013). In part, low prices result from innovations that reduce costs and from e-commerce itself which reduces capital commitment since no physical store is needed. However, low prices are also a consequence of Amazon's power to subordinate suppliers and companies offering in its marketplace. Third-party sellers, which by 2018 represented 58% of the total units sold at Amazon

[20] While Amazon's revenues mostly come from its e-commerce activity, AWS metrics are outstanding (Amazon, 2018). Indeed, as observed by Wu and Gereffi (2018), the fact that it is considered a separate business unit, regardless of its technical specificities, illustrates its importance.

(Amazon, 2019), accept its fees and sales conditions.[21] Amazon compels them to sell at cheaper prices which assures greater sales, thus profits for Amazon, but lowers complementors' profits per unit sold. Furthermore, they also accept Amazon's payment conditions, receiving payments some time after consumers' purchase (Norfield, 2017). Overall, Amazon's relation with suppliers and third-parties is predatory since it is a direct relation of spoliation that allows Amazon to appropriate part of the value produced in companies both selling at its marketplace or manufacturing for Amazon.

Amazon may be seen as an example of what Crouch (2011) called the doctrine of consumer welfare, where market concentration is justified by greater consumer welfare. As the author explains, these arguments have been used by US corporations facing anti-trust claims. As Amazon appropriates more value from subordinate companies, they will compensate these pressures on profits by passing on part of the burden to their workers, worsening labour conditions and wages, and engendering new forms of worker poverty (Selwyn, 2019; Smith, 2016). In the case of Amazon, the low wages of temporary workers in warehouses contribute to low prices (Bruder, 2017). Thus, at least to some extent, lower prices at Amazon's marketplaces, are being *paid* by workers.

The following example illustrates how Amazon interacts with subordinate companies. Once Amazon became an intellectual monopoly harvesting data from its marketplace, it used its scale to get up to 70% discounts with shipping companies like UPS and FedEx (Kahn, 2017). To counterbalance this loss, delivery companies increased fees for other customers. While lower delivery costs allowed Amazon to reduce prices, both effects contributed to the establishment of another profitable business: Fulfillment-by-Amazon (FBA). FBA provides storage, packing and shipping, targeted to those rival e-commerce companies that otherwise would have to pay higher delivery costs to shipping companies. Hence, Amazon's predatory practices result in rival companies ending up as subordinates.

The next section will argue that Amazon establishes predatory relationships also with organizations participating in its innovation networks, allowing Amazon to capture associated intellectual rents.

4.3. Amazon's intellectual rent predation from its innovation networks.

As mentioned, intellectual monopolies plan their innovation strategies building networks with other actors as well as innovating in-house. If we only consider Amazon's patent portfolio assignees, we may conclude that it follows an in-house R&D strategy (Table 1). Amazon owned a total of 10 243 patents (February 2018). Only 13 were co-owned with other companies (including Oracle and Samsung), one of which was owned by two firms besides Amazon. Secrecy seems to be another relevant dimension of its innovation strategy. According to a former employee, Amazon's employees only attend scientific conferences to listen to stimulating or potentially path-breaking ideas, but seldom presented their own research (Clarck, 2014).

Table 1. Amazon's patent type of co-owners.

Co-owner	**Frequency**	**Number of distinct documents**

[21] Amazon and Hachette's dispute is an example of how the former deals with subordinated companies like the latter when they do not comply. Amazon raised this publisher's prices on its web, delayed the delivery of its books and steered customers to other publishers to show its enforcement capacity to offer consumers lower prices by squeezing subordinate companies' profits (Krugman, 2014).

Individual	10 361	3 363
Companies	14	13

Source: Author's analysis based on Derwent Innovation.

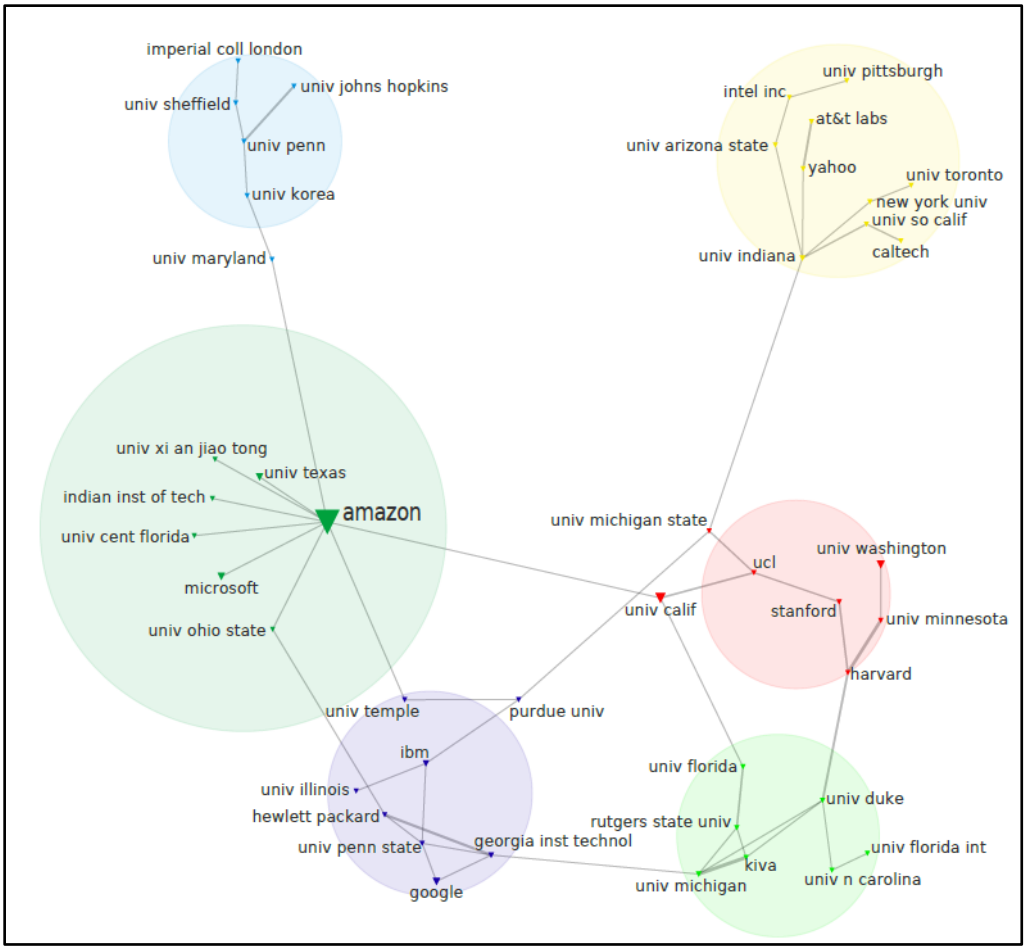
Around a third of Amazon's patents are co-owned with at least one individual (3,363 patents with a total of 10 361 individuals' names, since patents can be owned by more than one person besides Amazon). Among individuals, Jeff Bezos co-owns 68 of those patents. Twelve other individuals co-own 40 or more patents with Amazon. Using LinkedIn and ResearchGate, it is possible to show that all of them are or were Amazon employees or worked at its acquired or subsidiary firms like Rawles, Liquavista BV, Kiva Sys or Elemental Technologies, Inc.

Amazon's patent ownership structure gives, however, an incomplete and misleading picture of its innovation strategy. Amazon relies on outsourced innovation modules for app development (for instance for Alexa, Amazon's virtual assistant) (Brustein, 2016). It also harvests open-source software code. It sometimes sponsors open software initiatives like the Linux Foundation in order to remain close to open source ecosystems and to profit from the ideas and knowledge of the open source community (Schrape, 2017).

Another way to illustrate how Amazon captures intellectual rents from other organizations' creativity is to map and analyse its scientific publications' co-authorship network (Figure 5). Amazon's first scientific publication dates from 1996. Its publishing activity was negligible until recently. With 20 publications in 2012, in 2017 it reached its peak with 121 publications.

Figure 5. Amazon scientific publications co-authorship network map.[22]

[22] Amazon is connected to every institution, but the chosen Chi2 metrics prioritizes as direct connections only the most frequent links in relation to the total links each node has. Moreover, higher co-authorship frequencies are grouped in the same cluster.



Source: Author's analysis based on Web of Science data extraction.

Amazon co-published with almost 600 different organizations including other intellectual monopolies, start-ups, universities and public science and technology bodies. Especially in the last five years (75% of its papers were published between 2014 and 2018) knowledge modules are being co-produced with other organizations, as shown in Figure 5, which describes Amazon's most frequently connected co-authors' affiliations. Therefore, they can be considered as belonging to Amazon's recurrent innovation networks. By knowing which organizations could contribute to each step or module of its different R&D projects, Amazon garners intellectual rents.

In the map it is also possible to identify bridging institutions that connect Amazon with other organizations. For instance, by partnering with the University of Maryland, Amazon gets to work with Korea University and through this institution with the University of Pennsylvania. In concrete terms, this means that Amazon publishes more papers with the University of Maryland and that sometimes, in these papers, they also have co-authors from Korea University. So, Amazon is linked with the latter through its research with the University of Maryland.

The fact that institutions that co-publish and participate in its innovation networks are not co-owning its patents provides evidence of Amazon's capacity to capture intellectual rents from knowledge produced within those networks, thus predating from its direct research partnerships with these organizations.

Figure 5 shows three clusters that link Amazon with other intellectual monopolies like Google, Microsoft and Intel (as well as with former leader corporations like Yahoo and a dozen research universities mainly from the United States). These clusters show technological cooperation between intellectual monopolies. Technological cooperation between platform leaders has been described as a process where they support each other or use each other's platforms to further innovate (Gawer, 2014). Another example of technological cooperation is JPMorgan, Amazon and Berkshire healthcare venture focusing on joint technological solutions (Masters, 2018).

While intellectual monopolies cooperate in certain innovation steps, they also engage in a fierce technological competition. Continuous innovation, for intellectual monopolies, is a preferred competition strategy over lowering prices (Shelanski, 2013). Following Dolata (2017), in the ICT industry competition is defined more by innovation than by price. Intellectual monopolies like Amazon also present specificities in relation to other general trends of contemporary capitalism, which we explore next.

5. Intellectual monopolies' financialization and political power

In this section, we first explore the interplay between financialization and intellectual rentierism and, second, the specificities of data-driven intellectual monopolies' political power.

Leading global companies have globalized their financial affairs in such a way they minimize their paid corporate income taxes. In particular, intellectual monopolies use their power and global scale to offshore intellectual property to tax havens (Durand & Milberg, 2019; Schwartz, 2016). Intangibles-intensive corporations have greater opportunities to engage in offshore financial centres where they allocate profits by using offshore entities (Bryan et al., 2017; Jackson et al., 2014; Orhangazi, 2018). Such operations leading to lower tax bills. Financialized profits are harder for companies with higher shares of tangible over intangible assets, but they are extremely simple for companies like Amazon, which base their power and profits in intangibles' accumulation. Intellectual monopolies have greater chances to profit from tax loopholes.

Intellectual monopolies, thus, play on two rentier fronts: they garner different types of intellectual rents and have greater capacities to use their assets as financial assets. Their strong economic position is used as leverage to make financial gains, and they exploit differences in national taxing systems to get further gains. As explained by Bryan et al. (2017), offshoring of intangibles augments the portion of these earnings kept by intellectual monopolies and, by setting a financialization scheme, they further expand their profits. Intangibles, as these authors conclude, play a double role as industrial and financial assets. In this respect, it should not be a surprise that the top ten companies in terms of offshored savings are high-tech and big pharma corporations (Pozsar, 2018).

A particular way in which intangibles and financialization get intertwined is reflected in changes in goodwill -defined as the difference between a company's book and market value- due to M&As. While it is supposed to account for unmeasured intangibles, Serfati (2008) argues that goodwill also includes an over value because as soon as a future M&A is made public, the market values of involved companies increase, thus artificially increasing goodwill. For instance, Wholefoods' stocks increased 28% after Amazon's acquisition plan was announced (Eaglesham, 2020; Whitten, 2017).

Such financial operations lead to greater financial strength, which further increases entry barriers for newcomers. Elaborating on Dolata (2017, 2019), a sufficient condition for heavily investing in R&D -like Amazon- is to enjoy an extraordinary financial strength. A similar observation was made by Montalbán and Sakinç (2013, p. 987) when studying big pharmaceuticals' business model. As explained by these authors, big pharma's financial policy is significantly oriented to R&D investment, and self-financing and equity are used 'to overcome investment uncertainty'.

Another mechanism that consolidates intellectual monopolies is their direct actions to influence the political system. It is well-known that leader corporations like Amazon invest in the lobbying with political representatives (Zingales, 2017). Yet, Crouch (2011) claims that these corporations' political power goes beyond lobbying. According to the author, big corporations are major insider participants of the political process because the State has outsourced part of its role as policymaker to these companies. An example concerning the spread of intellectual monopolies was the active role of companies like Merck and Microsoft drafting first versions of what ended up being the TRIPs agreement (Drahos, 1995). Corporate political power is expanded by data-driven intellectual monopolies. Centralized data of world citizens and organizations is a paramount source of political power that can be used in exchange for economic power or resist government regulations. In particular, high-tech data-driven intellectual monopolies have been in charge of web data policies: they define data security and data privacy policies and are also entitled to decide whether to ban content from their platforms. Hence, they have global political power through their control of digital circulation of information.

Furthermore, data-driven intellectual monopolies take over states' responsibilities such as the JEDI project for providing cloud computing services to the US Department of Defense. Facial recognition algorithms, like Amazon's Rekognition, is another example. It has raised racial issues because they were programmed and trained in a way that misidentifies black people. Moreover, facial recognition has raised concerns about governments' missuses, risking civil and human rights. As these companies' innovations underpin the state's power, State's dependence reinforces data-driven intellectual monopolies' economic power. The recent claim of the US government urging Apple to unlock a Saudi air force officer's iPhone (Shubber, 2020) illustrates that the US government depends on the collaboration of Apple in what the US government considers as security issues. This has recently become self-evident at the global level with States depending on Apple and Google joint technology for CoVid-19 contact tracing (M. Johnson et al., 2020).

The interplay between financial and intellectual rentierism, as well as data-driven intellectual monopolies' political power are important themes for future research on intellectual monopolies.

6. Concluding remarks

In this paper, we elaborated on the intellectual monopoly theory as a form of predation and rentiership using Amazon as a case study. All types of intellectual rents considered, we have argued that Amazon combines legal and know-who intellectual monopolies with the centralization of data and secrecy. Comparing its co-publications' network with its patent portfolio ownership structure we demonstrated that some of Amazon's intellectual rents spring from the assetization of knowledge that was not produced in-house but by establishing a predatory relationship with the organizations participating in its innovation networks. These data also showed that Amazon's innovation strategy is twofold: while

it creates products and opens new markets relying on its retrieved and analysed data, it also develops Industry 4.0 technologies to achieve process innovations in storage and distribution and/or to offer them in its cloud service.

By planning its production and innovation networks, Amazon has become a visible hand. As an intellectual monopoly, Amazon can plan all its regular turnover, as well as way forward by setting the routes (always with degrees of uncertainty) for future innovations.

The analysis of Amazon's and of other intellectual monopolies' strategies indicates that there is a need to reassess financial strategies of big corporations as maximizing shareholder value in the short term (Lazonick & O'sullivan, 2000; Montalban et al., 2019). To illustrate, Amazon's first letter to shareholders -which was included in every annual report since then- highlights its old-style 'retain and reinvest' strategy where bold investments, particularly in intangible assets, are presented as an advantage for shareholders as opposed to maximizing shareholder value in the short-term. As far as the stock price keeps rising, shareholders will still benefit in the short-term. So far, this has been Amazon's case, even in the midst of CoVid-19 pandemic which saw Amazon's e-commerce business sore while the global economy entered an unprecedented decline. If the expansion of digital habits endure beyond the pandemic, Amazon may cement a monopolistic position in e-commerce (and AWS) which, as this paper has shown, is based on rentiership and predation.

Amazon can be conceived as an intellectual monopoly investing most of its surplus in intangibles, giving less emphasis on short term profits. Still, we have also argued that the way profits are calculated –with R&D as an expense instead of as an intangible investment- leads to relatively lower profits for intangible-intensive companies like Amazon. This has contributed to disguise Amazon's monopoly. Low margins coupled with low prices contribute to explain why, until recently, Amazon did not draw much attention from antitrust authorities.

Our analysis gives rise to a series of items for the future research agenda. One issue relates to how the spread of global intellectual monopolies challenges States' power not only because of these monopolies' market power, tax avoidance and the underlying privatization of knowledge. In the case of high-tech companies like Amazon, initiatives based on their innovations are challenging the frontiers between economic and political realms. Among others, setting regulations on data privacy, Blue Origin –Amazon's space exploration program- and Libra -Facebook's cryptocurrency- should be further analysed as instances where global intellectual monopolies take over what used to be conceived as State responsibilities. In this vein, an underlying question to be addressed in future research deals with understanding the dialectic relation of intellectual monopolies and core States.

In the light of intellectual monopolies outsourcing of innovation modules we see a need to reconsider what constitutes core competences and core business. Another issue relates to financialization strategies of intellectual monopolies, including the role of IPR management. Finally, there is a need to link to each other lower prices for consumers emanating from the spread of internet platforms and deteriorating labour conditions inside production and innovation networks.

7. References

Abecassis, P., & Coutinet, N. (2006). Connaissance et transformations dans l'industrie pharmaceutique, Une approche en terme de système sectoriel d'innovation. *Communication Aux XXVIIIèmes JESF*. Communication aux XXVIIIèmes JESF, France. http://economix.fr/docs/101/jesf2007.pdf

Ackerman, E. (2018). Brad Porter, VP of Robotics at Amazon, on Warehouse Automation, Machine Learning, and His First Robot. *IEEE Spectrum*. https://spectrum.ieee.org/automaton/robotics/industrial-robots/interview-brad-porter-vp-of-robotics-at-amazon

Amazon. (2016). *Amazon Annual Report 2015*.

Amazon. (2018). *Amazon Annual Report 2017*.

Amazon. (2019). *Amazon Annual Report 2018*.

Amazon. (2020). *AMAZON.COM Announces First Quarter Results 2020* [Press Release]. https://ir.aboutamazon.com/news-release/news-release-details/2020/Amazoncom-Announces-First-Quarter/

Antonelli, C. (1999). The evolution of the industrial organisation of the production of knowledge. *Cambridge Journal of Economics*, *23*(2), 243–260.

Baran, P. A., & Sweezy, P. M. (1966). *Monopoly capital*. NYU Press.

Baranes, A. I. (2016). *An Original Institutionalist Approach to the Structure, Conduct, and Performance of the Pharmaceutical Industry: The Importance of Intangible Assets* [PhD Thesis]. University of Missouri-Kansas City.

Barbier, M., Bompart, M., Garandel-Batifol, V., & Mogoutov, A. (2012). Textual analysis and scientometric mapping of the dynamic knowledge in and around the IFSA community. In I. Darnhofer, D. Gibbon, & B. Dedieu (Eds.), *Farming Systems Research into the 21st century: The new dynamic* (pp. 73–94). Springer.

Barr, A. (2011). FEATURE-Amazon finds startup investments in the 'cloud'. *Reuters*. https://www.reuters.com/article/amazon-cloud-idUSN1E7A727Q20111109

Barringer, S. N., & Slaughter, S. (2016). University trustees and the entrepreneurial university: Inner circles, interlocks, and exchanges. In *Higher Education, Stratification, and Workforce Development* (pp. 151–171). Springer. http://link.springer.com/chapter/10.1007/978-3-319-21512-9_8

Bensinger, G. (2012, June 27). Competing with Amazon on Amazon. *Wall Street Journal*. http://www.wsj.com/articles/SB10001424052702304441404577482902055882264

Bergvall-Kareborn, B., & Howcroft, D. (2013). The Apple business model: Crowdsourcing mobile applications. *Accounting Forum*, *37*, 280–289.

Birch, K. (2017). Rethinking value in the bio-economy: Finance, assetization, and the management of value. *Science, Technology, & Human Values*, *42*(3), 460–490.

Birch, K. (2019). Technoscience rent: Toward a theory of rentiership for technoscientific capitalism. *Science, Technology, & Human Values*, 0162243919829567.

Brown, A. (2018). Rise of the machines? Amazon's army of more than 100,000 warehouse robots still can't replace humans because they lack 'common sense'. *Daily Mail Online*. https://www.dailymail.co.uk/sciencetech/article-5808319/Amazon-100-000-warehouse-robots-company-insists-replace-humans.html

Bruder, J. (2017). Meet the CamperForce, Amazon's Nomadic Retiree Army. *Wired*. https://www.wired.com/story/meet-camperforce-amazons-nomadic-retiree-army/

Brustein, J. (2016, April 19). The Real Story of How Amazon Built the Echo. *Bloomberg Businessweek*. https://www.bloomberg.com/features/2016-amazon-echo/

Bryan, D., Rafferty, M., & Wigan, D. (2017). Capital unchained: Finance, intangible assets and the double life of capital in the offshore world. *Review of International Political Economy*, *24*(1), 56–86.

Chandler Jr, A. D. (1993). *The visible hand*. Harvard University Press.

Chen, W., Gouma, R., Los, B., & Timmer, M. P. (2017). *Measuring the income to intangibles in goods production: A global value chain approach*. World Intellectual Property Organization-Economics and Statistics Division.

Clarck, J. (2014). Amazon's 'schizophrenic' open source selfishness scares off potential talent, say insiders. *The Register*. https://www.theregister.co.uk/2014/01/22/amazon_open_source_investigation/

Contractor, F. J., Kumar, V., Kundu, S. K., & Pedersen, T. (2010). *Global outsourcing and offshoring: An integrated approach to theory and corporate strategy*. Cambridge University Press.

Corrado, C., Hulten, C., & Sichel, D. (2005). Measuring capital and technology: An expanded framework. In *Measuring capital in the new economy* (pp. 11–46). University of Chicago Press.

Crouch, C. (2011). *The Strange Non-Death of Neoliberalism* (Polity). Polity.

Crouzet, N., & Eberly, J. (2018). Intangibles, investment, and efficiency. *AEA Papers and Proceedings*, *108*, 426–31.

Danzon, P. M., Nicholson, S., & Pereira, N. S. (2005). Productivity in pharmaceutical–biotechnology R&D: The role of experience and alliances. *Journal of Health Economics*, *24*(2), 317–339.

Dolata, U. (2017). *Apple, Amazon, Google, Facebook, Microsoft: Market concentration-competition-innovation strategies*. Stuttgarter Beiträge zur Organisations-und Innovationsforschung, SOI ….

Dolata, U. (2019). Privatization, curation, commodification. *Österreichische Zeitschrift Für Soziologie*, *44*(1), 181–197.

Dosi, G. (1988). Sources, procedures, and microeconomic effects of innovation. *Journal of Economic Literature*, *26*(3), 1120–1171.

Drahos, P. (1995). Global property rights in information: The story of TRIPS at the GATT. *Prometheus*, *13*(1), 6–19.

Dreyfuss, R., & Frankel, S. (2014). From incentive to commodity to asset: How international law is reconceptualizing intellectual property. *Mich. J. Int'l L.*, *36*, 557.

Durand, C., & Milberg, W. (2019). Intellectual monopoly in global value chains. *Review of International Political Economy*, 1–26. https://doi.org/10.1080/09692290.2019.1660703

Eaglesham, J. (2020). Goodwill Sparks Deep Division, at Least on Balance Sheets. *The Wall Street Journal*. https://www.wsj.com/articles/goodwill-sparks-deep-division-at-least-on-balance-sheets-11579613906?mod=hp_lead_pos3

Ernst, D. (2008). *Can Chinese IT firms develop innovative capabilities within global knowledge networks?* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2742950

Ernst, D. (2009). *A new geography of knowledge in the electronics industry? Asia's role in global innovation networks*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2742923

Feiner, L. (2019). Amazon admits to Congress that it uses 'aggregated' data from third-party sellers to come up with its own products. *CNBC*. https://www.cnbc.com/2019/11/19/amazon-uses-aggregated-data-from-sellers-to-build-its-own-products.html

Foley, D. K. (2013). Rethinking financial capitalism and the "information" economy. *Review of Radical Political Economics*, *45*(3), 257–268.

Fourcade, M., & Healy, K. (2016). Seeing like a market. *Socio-Economic Review*, *15*(1), 9–29.

Galloway, S. (2017). *The Four: The Hidden DNA of Amazon, Apple, Facebook, and Google*. Penguin.

Gawer, A. (2014). Bridging differing perspectives on technological platforms: Toward an integrative framework. *Research Policy*, *43*(7), 1239–1249.

Gereffi, G. (2014). Global value chains in a post-Washington Consensus world. *Review of International Political Economy*, *21*(1), 9–37.

Harvey, D. (2002). *Spaces of capital: Towards a critical geography*. Routledge.

Harvey, D. (2007). *A brief history of neoliberalism*. Oxford University Press, USA.

Haskel, J., & Westlake, S. (2018). *Capitalism without capital: The rise of the intangible economy*. Princeton University Press.

Jackson, G., Brammer, S., Karpoff, J. M., Lange, D., Zavyalova, A., Harrington, B., Partnoy, F., King, B. G., Deephouse, D. L., & Jackson*, G. (2014). Grey areas: Irresponsible corporations and reputational dynamics. *Socio-Economic Review*, *12*(1), 153–218.

Jiang, E. (2018, December 3). Amazon briefly becomes the world's most valuable publicly traded company (AAPL, AMZN). *Markets Insider*. https://markets.businessinsider.com/news/stocks/amazon-stock-price-worlds-most-valuable-publicly-traded-company-2018-12-1027776766

Johnson, B., & Lundvall, B. A. (1994). The learning economy. *Journal of Industry Studies*, *1*(2), 23–42.

Johnson, M., Abboud, L., Warrell, H., & Bradshaw, T. (2020, May 1). Europe split over approach to virus contact tracing apps. *Financial Times*. https://www.ft.com/content/10f87eb3-87f9-46ea-88ab-8706adefe72d

Kahn, L. (2017). Amazon's Antitrust Paradox. *The Yale Law Journal*, *126*(3). https://www.yalelawjournal.org/note/amazons-antitrust-paradox

Kaplinsky, R. (1998). *Globalisation, industrialisation and sustainable growth: The pursuit of the nth rent*. Institute of Development Studies, University of Sussex Sussex.

Klingler-Vidra, R. (2016). When venture capital is patient capital: Seed funding as a source of patient capital for high-growth companies. *Socio-Economic Review*, *14*(4), 691–708.

Kraemer, K., Linden, G., & Dedrick, J. (2011). Capturing value in Global Networks: Apple's iPad and iPhone. *University of California, Irvine, University of California, Berkeley, y Syracuse University, NY. Http://Pcic. Merage. Uci. Edu/Papers/2011/Value_iPad_iPhone. Pdf. Consultado El*, *15*. https://pdfs.semanticscholar.org/9cb5/262a46e7c9131de43433b7c5f9b65386f8e2.pdf

Krugman, P. (2014, October 19). Amazon's Monopsony Is Not O.K. *The New York Times*. https://www.nytimes.com/2014/10/20/opinion/paul-krugman-amazons-monopsony-is-not-ok.html

Kurz, M. (2017). *On the Formation of Capital and Wealth: IT, Monopoly Power and Rising Inequality*.

Lan, S., Liu, K., & Dong, Y. (2019). Dancing with wolves: How value creation and value capture dynamics affect complementor participation in industry platforms. *Industry and Innovation*, 1–21.

Lane, C. (2007). National capitalisms and global production networks: An analysis of their interaction in two global industries. *Socio-Economic Review*, *6*(2), 227–260. https://doi.org/10.1093/ser/mwm010

Lazonick, W., & O'sullivan, M. (2000). Maximizing shareholder value: A new ideology for corporate governance. *Economy and Society*, *29*(1), 13–35.

Liu, J., Chaminade, C., & Asheim, B. (2013). The geography and structure of global innovation networks: A knowledge base perspective. *European Planning Studies*, *21*(9), 1456–1473.

Mason, J. (2015). Understanding short-termism: Questions and consequences. *Roosevelt Institute Report*.

Masters, B. (2018, February 2). Amazon is taking a welcome tilt at healthcare bills. *Financial Times*. https://www.ft.com/content/7a20b6f2-080b-11e8-9650-9c0ad2d7c5b5

Mattioli, D. (2020a, April 16). Amazon Retools With Unusual Goal: Get Shoppers to Buy Less Amid Coronavirus Pandemic. *The Wall Street Journal*. https://www.wsj.com/articles/amazon-retools-with-unusual-goal-get-shoppers-to-buy-less-amid-coronavirus-pandemic-11587034800

Mattioli, D. (2020b, April 23). Amazon Scooped Up Data From Its Own Sellers to Launch Competing Products. *The Wall Street Journal*. https://www.wsj.com/articles/amazon-scooped-up-data-from-its-own-sellers-to-launch-competing-products-11587650015?shareToken=ste33aa685b41e426fbc99de4b3bbaaf45

Mazzucato, M. (2015). *The entrepreneurial state: Debunking public vs. private sector myths* (Vol. 1). Anthem Press.

Milberg, W., & Winkler, D. (2013). *Outsourcing economics: Global value chains in capitalist development*. Cambridge University Press.

Montalban, M., Frigant, V., & Jullien, B. (2019). Platform economy as a new form of capitalism: A Régulationist research programme. *Cambridge Journal of Economics*.

Montalban, M., & Sakinç, M. E. (2013). Financialization and productive models in the pharmaceutical industry. *Industrial and Corporate Change*, *22*(4), 981–1030.

Moudud, J. K. (2013). The hidden history of competition and its implications. In J. K. Moudud, C. Bina, & P. L. Mason (Eds.), *Alternative Theories of Competition: Challenges to the Orthodoxy* (pp. 27–54). Routledge.

Mussomeli, A., Gish, D., & Laaper, S. (2016). The rise of the digital supply network: Industry 4.0 enables the digital transformation of supply chains. *Deloitte Insights, December*, *1*.

Nicas, J., & Wakabayashi, D. (2020). Sonos squeezed by the tech giants, sues Google. *The New York Times*. https://www.nytimes.com/2020/01/07/technology/sonos-sues-google.html

Norfield, T. (2017, July 27). Amazon: Becoming the Market. *Economics of Imperialism*. https://economicsofimperialism.blogspot.com/2017/07/amazon-becoming-market.html

Nuccio, M., & Guerzoni, M. (2019). Big data: Hell or heaven? Digital platforms and market power in the data-driven economy. *Competition & Change*, 1024529418816525.

OECD. (2011). *New sources of growth: Intangible assets*. OECD Publishing.

Orhangazi, Ö. (2018). The role of intangible assets in explaining the investment–profit puzzle. *Cambridge Journal of Economics*.

Pagano, U. (2014). The crisis of intellectual monopoly capitalism. *Cambridge Journal of Economics*, *38*(6), 1409–1429.

Park, K., & Mense-Petermann, U. (2014). Managing across borders: Global integration and knowledge exchange in MNCs. *Competition & Change*, *18*(3), 265–279.

Parrilli, M. D., Nadvi, K., & Yeung, H. W. (2013). Local and regional development in global value chains, production networks and innovation networks: A comparative review and the challenges for future research. *European Planning Studies*, *21*(7), 967–988.

Peters, R. H., & Taylor, L. A. (2017). Intangible capital and the investment-q relation. *Journal of Financial Economics*, *123*(2), 251–272.

Pistor, K. (2019). *The Code of Capital: How the Law Creates Wealth and Inequality*. Princeton University Press.

Pooler, M. (2017). Amazon robots bring a brave new world to the warehouse. *Financial Times*. https://www.ft.com/content/916b93fc-8716-11e7-8bb1-5ba57d47eff7

Pozsar, Z. (2018). Repatriation, the Echo-Taper and the€/$ Basis. *Global Money Notes*, *11*.

Rikap, C. (2018). Innovation as Economic Power in Global Value Chains. *Revue d'Économie Industrielle*, *163*, 35–75.

Rikap, C. (2019). Asymmetric Power of the Core: Technological Cooperation and Technological Competition in the Transnational Innovation Networks of Big Pharma. *Review of International Political Economy*, *26*(5), 987–1021. https://doi.org/10.1080/09692290.2019.1620309

Schrape, J.-F. (2017). Open-source projects as incubators of innovation: From niche phenomenon to integral part of the industry. *Convergence*, 1354856517735795.

Schwartz, H. M. (2016). Wealth and Secular Stagnation: The Role of Industrial Organization and Intellectual Property Rights. *The Russell Sage Foundation Journal of the Social Sciences*, *2*(6), 226–249.

Selwyn, B. (2019). Poverty chains and global capitalism. *Competition & Change*, *23*(1), 71–97.

Serfati, C. (2008). Financial dimensions of transnational corporations, global value chain and technological innovation. *Journal of Innovation Economics & Management*, *2*, 35–61.

Shelanski, H. A. (2013). Information, innovation, and competition policy for the Internet. *U. Pa. L. Rev.*, *161*, 1663.

Shubber, K. (2020). US presses Apple to unlock iPhones of Saudi gunman. *Financial Times*. https://www.ft.com/content/eb3cf780-3642-11ea-a6d3-9a26f8c3cba4

Smith, J. (2016). *Imperialism in the Twenty-First Century: Globalization, Super-Exploitation, and Capitalism's Final Crisis*. NYU Press.

Stone, B. (2013). *The everything store: Jeff Bezos and the age of Amazon*. Random House.

Strange, S. (1996). *The retreat of the state: The diffusion of power in the world economy*. Cambridge university press.

Sturgeon, T. J. (2009). From commodity chains to value chains: Interdisciplinary theory building in an age of globalization. In J. Bair (Ed.), *Frontiers of Commodity Chain Research* (pp. 110–135). Stanford University Press. http://isapapers.pitt.edu/84/

Synergy Research Group. (2019). *Fourth quarter growth in cloud services tops off a banner year for cloud providers.* https://www.srgresearch.com/articles/fourth-quarter-growth-cloud-services-tops-banner-year-cloud-providers

Tancoigne, E., Barbier, M., Cointet, J.-P., & Richard, G. (2014). The place of agricultural sciences in the literature on ecosystem services. *Ecosystem Services*, *10*, 35–48.

Teixeira, R. A., & Rotta, T. N. (2012). Valueless knowledge-commodities and financialization: Productive and financial dimensions of capital autonomization. *Review of Radical Political Economics*, *44*(4), 448–467.

UNCTAD. (2019). *Digital Economy Report 2019: Value creation and capture–Implications for developing countries*. United Nations.

Veblen, T. (1908). On the nature of capital: Investment, intangible assets, and the pecuniary magnate. *The Quarterly Journal of Economics*, *23*(1), 104–136.

Veblen, T. (2017). *The theory of the leisure class*. Routledge.

Whitten, S. (2017). Whole Foods stock rockets 28% on $13.7 billion Amazon takeover deal. *CNBC*. https://www.cnbc.com/2017/06/16/amazon-is-buying-whole-foods-in-a-deal-valued-at-13-point-7-billion.html

Wu, X., & Gereffi, G. (2018). Amazon and Alibaba: Internet Governance, Business Models, and Internationalization Strategies. In *International Business in the Information and Digital Age* (pp. 327–356). Emerald Publishing Limited.

Wu, Z., & Leahy, R. (1993). An optimal graph theoretic approach to data clustering: Theory and its application to image segmentation. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, *15*(11), 1101–1113.

Zhu, F., & Liu, Q. (2018). Competing with complementors: An empirical look at Amazon.com. *Strategic Management Journal*, *39*(10), 2618–2642. https://doi.org/10.1002/smj.2932

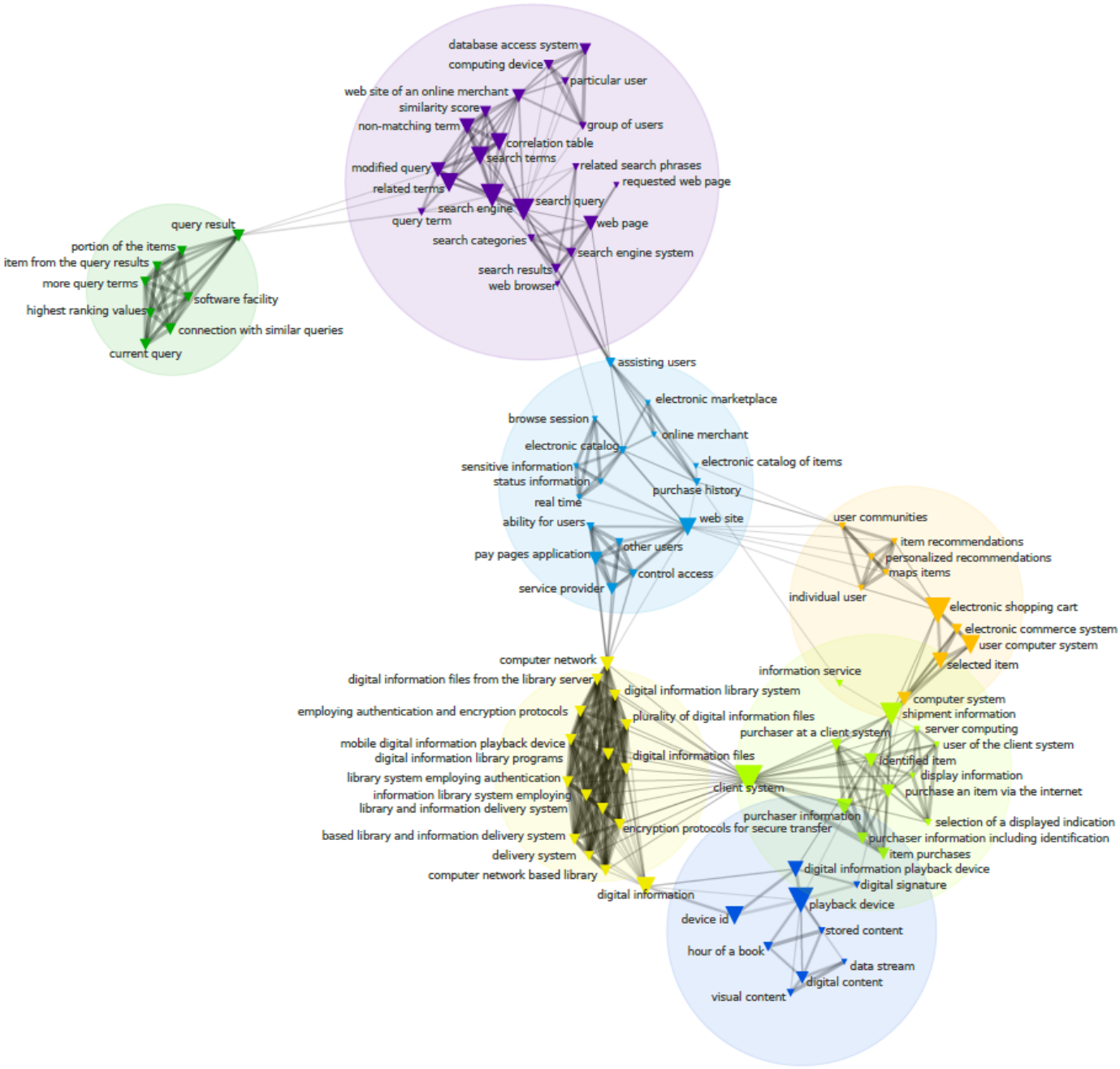
Appendix

Table A.1. Amazon granted patents containing within its most frequent terms the word “data”

Year	Patents with frequent terms containing the word "data"
1998	2
1999	1
2000	2
2001	1
2002	1
2003	2
2004	1
2005	3
2006	6
2007	3
2008	12
2009	10
2010	33
2011	41
2012	58
2013	115
2014	188
2015	232
2016	274
2017	312

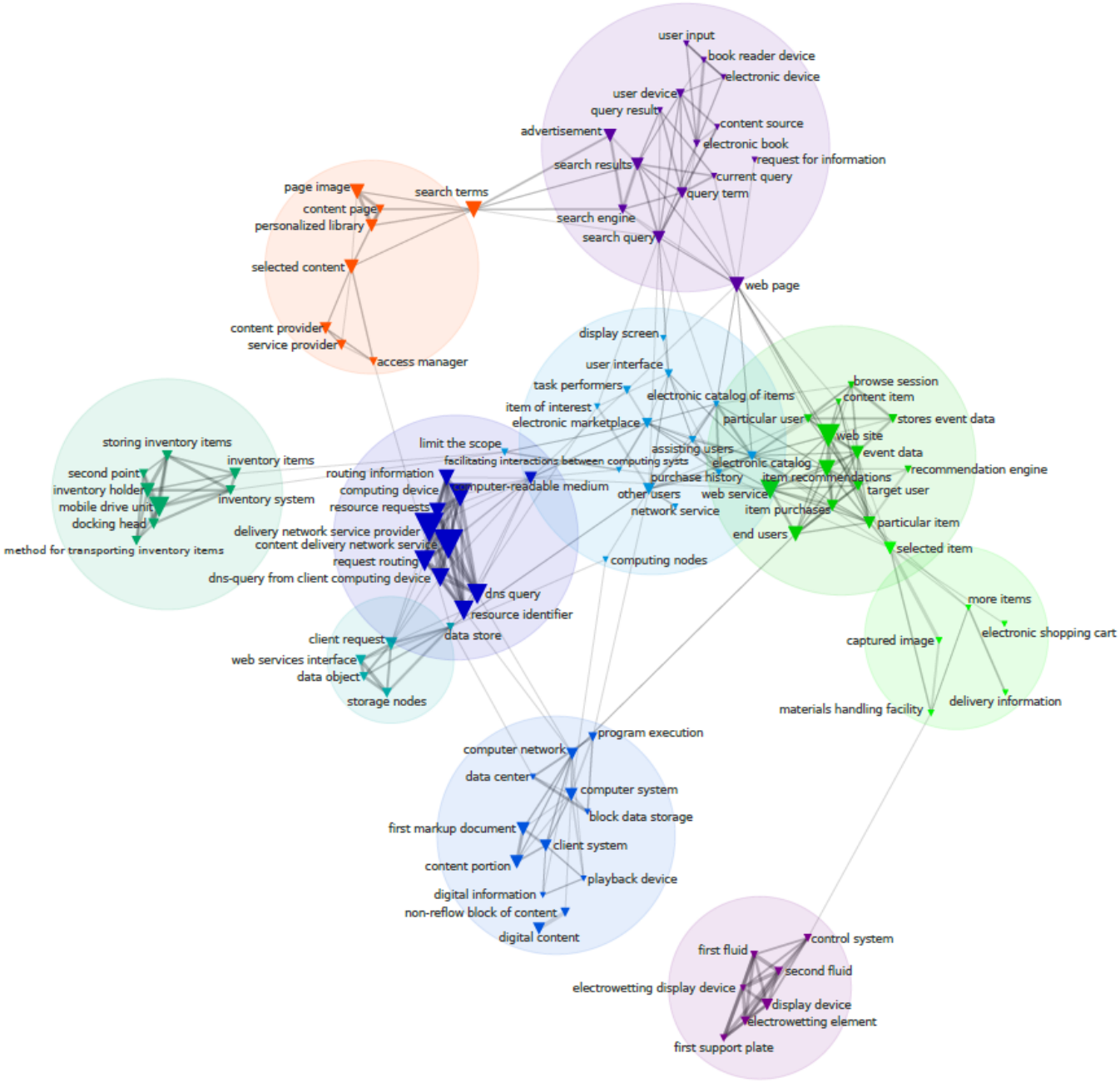
Source: Author’s analysis based on Derwent Innovation data extraction.

Figure A.1 Amazon's patents semantic analysis. Network map 1996-2004



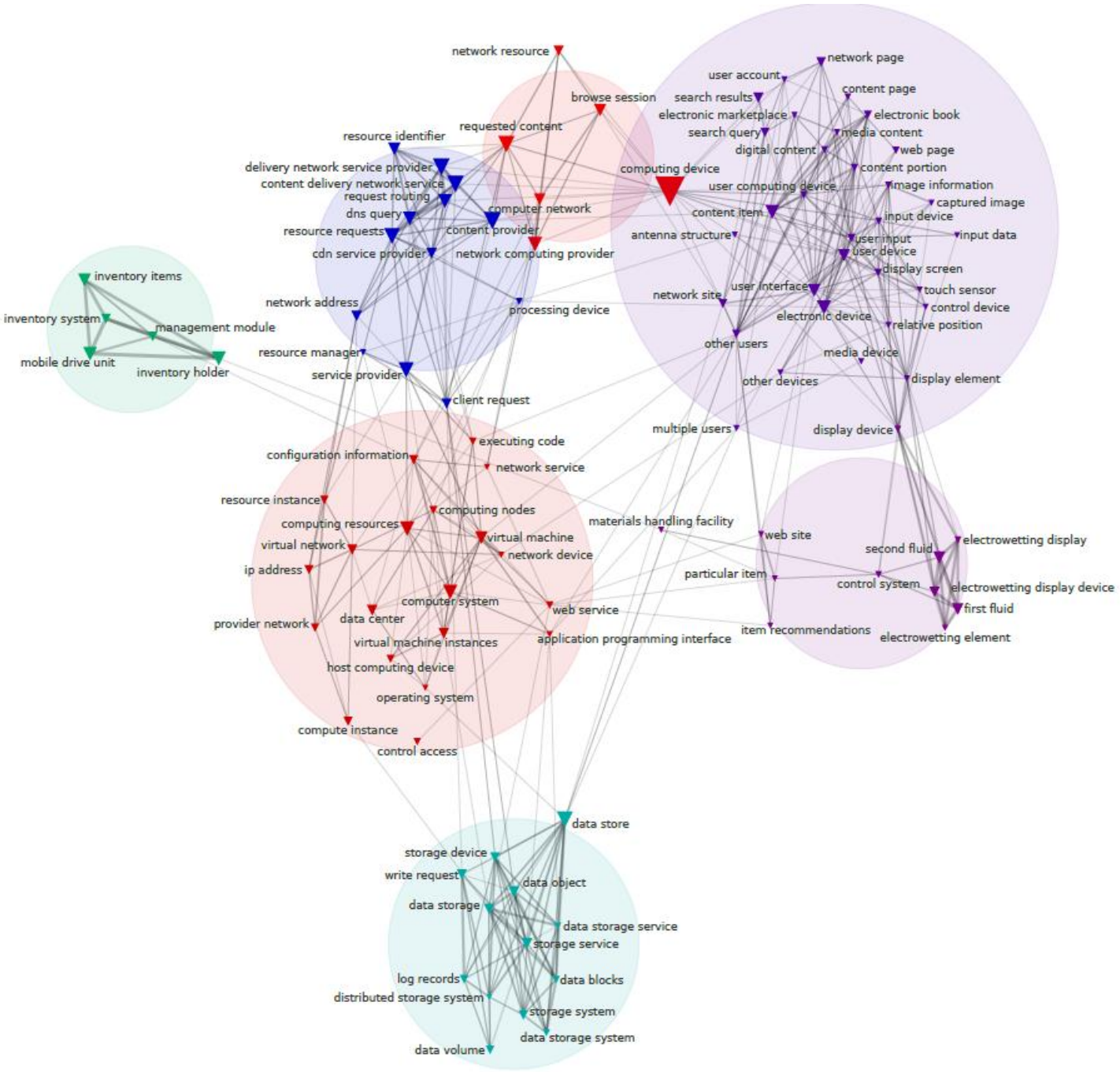
Source: Author's analysis based on Derwent Innovation data extraction.

Figure A.2 Amazon's patents semantic analysis. Network map 2005-2011



Source: Author's analysis based on Derwent Innovation data extraction.

Figure A.3 Amazon's patents semantic analysis. Network map 2011-feb2018



Source: Author's analysis based on Derwent Innovation data extraction.