

Governing digital platform power for industrial development: towards an entrepreneurial-regulatory state

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Data and digital platforms have simultaneously upended entrenched positions in some industries, opening-up greater and disruptive competition, while driving overall higher levels of concentration through the growing power of multi-sided digital platforms. The coexistence of rivalry and collusion – a key feature of Cowling’s monopoly capitalism – persists and takes new forms in the digital economy. Taking into account the heterogenous nature of platforms, this paper analyses the relationships between large digital platforms and the development of industrial capabilities, especially in middle-income countries and the implications for industrial and competition policies. We advance an analytical-policy framework connecting the different dimensions and sources of platform power responsible for value capture and extraction, and the different platform capability-functions responsible for value creation. Building on this recasting of Hymer’s ‘efficiency contradiction’ and Cowling theory of monopoly capitalism, we advance an integrated industrial-competition policy approach to overcome it and propose a conception of an ‘entrepreneurial-regulatory state’. Complementary industrial and competition policies are required to foster *optimal rivalry*, being a rivalry which rewards the development of dynamic capabilities and enables contestation by different business models.

Key words: Monopoly capitalism, Digital platforms, Power, Industrial policy, Competition policy, Entrepreneurial-regulatory state
JEL classifications: L10, L40, L50

1. Introduction

The digitalisation of economic activity has simultaneously upended entrenched positions in some industries, opening-up greater and disruptive competition, while driving overall higher levels of concentration through the growing importance of multi-sided digital platforms. Notwithstanding the disruption, it is now evident that the main digital platforms are the new and international providers of indispensable economic services, who perform key market functions, and largely avoid rent-destroying head-to-head competition. Indeed, as stressed by Cowling (1982), the coexistence of rivalry and

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collusion is a key feature of monopoly capitalism. This is reflected in the dramatic acceleration in cross-border data flows for commercial transactions and widespread diffusion of consumer and industrial data value chains, involving all economic sectors (Kenney and Zysman, 2016). Covid-19 has accelerated these trends (Rikap and Lundvall, 2021; UNCTAD, 2021). The largest digital platforms – Apple, Microsoft, Amazon, Alphabet (Google), Facebook, Tencent and Alibaba – are increasingly shaping all parts of the global data value chain (GVC), from data collection through user-facing platform services, to data transmission, storage, analysis, processing and use through artificial algorithms.

We focus in this article on the relationships between large digital platforms, the development of industrial capabilities and the implications for industrial and competition policies. To do this we propose an analytical-policy framework to address two critical issues. First, considering the heterogeneous nature of the platforms, we engage with the different dimensions of platform power. We integrate classical theories of monopoly capitalism and recent theories of platform economies, to highlight the *market shaping power* of platforms and their different types of monopoly, innovation and political rents. Second, we consider the relationship between platform functions, value creation and the development of industrial capabilities with a focus on middle-income countries. Building on this recasting of Hymer's efficiency contradiction (Hymer, 1970) and drawing on Cowling's seminal theory of monopoly capitalism (Cowling, 1982), we advance a conception of an 'entrepreneurial-regulatory state' implementing complementary industrial and competition policies. These policies can discipline the platform power and foster 'optimal rivalry', being a rivalry which rewards the development of dynamic capabilities and enables contestation by different business models. By doing so we also update the concept of 'optimal competition' proposed by Amsden and Singh (1994) in the study of Korea and Japan, to advance policy recommendations for today's middle-income countries facing digital platform power.

Platform power dynamics are at the centre of the assessment of the implications of digitalisation for new forms of uneven development. Our framework brings out the relationships between *value creation, capture and extraction*, the platform *capabilities-functions* and different *sources of platform power*. The tendency to concentration and economic power is inherent in the economics of platforms, as it is in the rationales for the internationalisation of business (Cowling and Sugden, 1987; Cowling and Tomlinson, 2011). As we explain further below, this is because of the combination of network effects, scale economies and data which are international in scope (Condorelli and Padilla, 2020; Jacobides and Lianos, 2021A; Jenny, 2021).

Dynamic capabilities and other complementary assets underpin not only value creation but also value capture by platform leaders (Teece, 2018). We introduce a distinction between the appropriability or capture of value in rents which reward investment and innovation (i.e. *innovation rents à la* Schumpeter/Penrose), and value extraction as exploitation of an entrenched position of economic power (i.e. *monopoly rents à la* Hymer/Cowling) often exercised through (and intertwined with) political influence (i.e. *political rents*), including 'divide and rule' strategies as explained by Cowling and Sugden (1994) in the context of transnationals. The businesses coordinate sometimes exponentially growing internal markets through the aggregation and processing of data, and realise external market dominance enabling the extraction of value and the shaping of markets in ways that block or absorb potential rivals which themselves sought to innovate.

The analytical framework we develop in Section 3 draws on the monopoly capitalism and uneven development literature, as highlighted in Section 2, and provides a bridge between this literature and those most recent contributions at the interface of platforms and ecosystems, political economy and law. The framework is built through considering (i) the implications of digitalisation for the internationalisation of business; (ii) the impacts on uneven development and a middle-income technology trap; and (iii) the implications for industrial and competition policy. In Section 4 we develop this analytical framework further to consider an integrated industrial and competition policy approach to digital platforms in middle-income countries, with a case study focused on South Africa. We conclude by stressing how in middle-income countries calls for regulation of the platforms, including data localisation, have largely not articulated the critical links between data, platforms and the development of domestic industrial capabilities.

2. Uneven development in the era of digital platforms

2.1 *The context*

Consumer and industrial data, combined with increasing data analytics concentrated around digital platforms, are reshaping markets and consumer dynamics, business models and industrial production (Kenney and Zysman, 2016). Opportunities arise from: (i) increasing availability and lowering costs of access to digital tools and computing resources; (ii) leveraging data in value creation processes to improve and transform existing activities, such as, more intelligent and agile manufacturing processes; (iii) deploying new business models enhancing coordination along supply chains and intermediation; (iv) reaching new markets; and, (v) developing new products with data-enhanced features and functionalities (Sturgeon, 2021; Roberts, 2020A; Whittaker et al., 2020).

However, these opportunities are not equally distributed across countries. First, this is because countries and companies are differently equipped with digital capabilities – with most middle-income countries being less capable to capture these opportunities and related digital dividends given their lack of intermediate, advanced and infrastructure digital capabilities (Andreoni et al., 2021A). Second, these opportunities are shaped and controlled by different types of digital platforms. Different types of platforms are used to extract economic value by acting as data infrastructures and market shapers. Specifically, the global economic power of GAFAM (Google, Amazon, Facebook, Apple and Microsoft) pose challenges to countries looking to build local capabilities where data in the hands of the platforms could be a competitive asset for local companies. The data could be critical for design and customisation of products, targeting of advertising and sales and identifying routes to local and export markets.

Digital platforms typically operate in multi-sided markets characterised by direct network effects between users on one side (where an additional user increases the value of the service to others on that side), as well as indirect and cross-side network effects where additional users on one side of the market increase the value to those on other sides (Condorelli and Padilla, 2020; Jacobides and Lianos, 2021A).

The global digital platforms typically combine cloud-computing power and algorithms which process data from a wide range of consumption, media, manufacturing and service activities. In some cases, platforms are transforming sectors by connecting

producers with each other and with consumers, in new ways, while exercising different degrees of intermediation. In other cases, platforms have been used to build ‘platforms of platforms’, that is, platforms enabling the construction of further and diverse types of platforms. Overall, global digital platforms have become key infrastructures intermediating and shaping market transactions and ecosystem relationships (Cremer et al., 2019; UK DCEP, 2019).

As stressed by Kenney and Zysman (2016, p. 2) ‘[i]f the industrial revolution was organised around the factory, today’s changes are organised around these digital platforms’. The evolution of business enterprise and corporate structure – from the national large corporation to the transnational corporation, until today’s digital platforms – is intrinsic to the process of capitalist accumulation and oligopolistic competition. Indeed – according to Hymer (1972, p. 123) – this evolution can be viewed as a ‘process of centralizing and perfecting the process of capital accumulation’. At the core of this process there is a persistent tension between value creation, value capture and extraction which was articulated in seminal contributions in the literature on monopoly capitalism. In what follows we turn to this literature to disentangle this tension as a building block to our analytical-policy framework in Section 3.

2.2 Corporate power, transnationals and the tension between value creation, capture and extraction

According to Chandler (1961), multidivisional corporations emerged in the 1920s as a powerful and flexible corporate form capable of supporting the expansion of the firm into new products and markets, thus combining ‘economies of growth’ with ‘economies of diversification’ (Penrose, 1959; see also Galbraith, 1967). For example, a corporation could ‘create competing product-lines in the same industry, thus increasing its market shares while maintaining the *illusion of competition*’ (Hymer, 1972, p. 120, italics added). Alliances, mergers, agreements, and groupings also played an increasing role.

Increasing returns at the firm-level implies fewer competitors (Hymer, 1970, p. 443). However, increasing size does not preclude fierce oligopolistic ‘competition among the few’ (Fellner, 1949; Cowling, 1982). Cowling’s theory of monopoly capitalism is grounded on the non-trivial idea that: ‘rivalrous behaviour and collusion coexist and result from a high degree of concentration within a specific market. The closer the rivalry, the more immediate is the response to any attempt to secure an advantage, but the very immediacy of the expected response serves to maintain the degree of collusion – it makes a breakaway movement unprofitable’ (1982, p. 12).

Deterrence of *potential competition* – hence entrance in the market – depends on the capacity to retaliate through leveraging excess production capacity and technological-organisational capability to do so. Before Cowling, Kalecki (1971) had already stressed that oligopolistic or monopolistic markets operate normally under conditions of excess production capacity. Especially where combined with scale economies, excess capacity can also be used as a deterrent to entry. Building on Kalecki (1971); Cowling (1982) emphasised that incumbents’ ability to deter entry is mostly about a ‘strategic capability’ pertaining to organisational competences in management, technology, R&D, marketing and distribution, and not simply about ‘excess capacity’ in production.

In the international competition context, Cowling and Sugden (1998, p. 67, 1994) posited that the capacity of ‘coordinating production from one centre of strategic

decision-making' is the essence of the modern, large transnational corporation. In transnational corporations, coordination spans across both market and non-market transactions which increase with free international trade. When trade is opened in a context of asymmetric power and capability, the growth of intra-industry trade enhances the power of the transnationals at the expense of smaller domestic rivals. Free trade results in increasing dominance of transnationals because of their upper hand in negotiations with both governments and labour (Cowling and Tomlinson, 2011).

In understanding the nature and rise of the multinational enterprises, Hymer also starts from the recognition that a 'theory of the growth of the firm' mainly focused on value creation dynamics – as in the one developed by Penrose (1959) – cannot fully explain the rise of multinationals and their monopoly power (Dunning and Pitelis, 2008). The foreign investment rush in the 1950s and 1960s was enabled by technological developments and driven by US multidivisional corporations seizing the opportunity of transferring organisational capabilities internationally via integration of global production chains and exchange (Hymer, 1970). From a transaction cost perspective, international integration further enables multinationals to protect their appropriation of returns through enforcing restrictions on use, avoiding bargaining with local monopolies and to protecting their technology and business models (Teece, 1985, p. 234).

However, according to Hymer (1970), direct foreign investments were also driven by the strategic attempt of multinationals to restrain competition between enterprises in different nations and extract greater profits. This includes leveraging their international structure of centralised planning and corporate control and, in so doing, by reducing competition in these markets towards global collusive oligopoly.

The evolution of business enterprises into multinational and transnationals is evidently driven by both value creation and value capture, and extraction dynamics. These dynamics are intrinsically linked to the co-existence of rivalry and collusion. It is driven by value creation dynamics due to asset-specific and scale-intensive investments and innovations, and industry coordination among non-market hierarchies – *value creation* via economies of growth and diversification (Schumpeter, 1942; Penrose, 1959; Pitelis, 1991). Asset-specific investments at sufficient scale are irreversible commitments of resources necessary for value creation and organisational learning. These relate to static and dynamic efficiencies tied-up with value creation and capture. Such is increasingly the case in the context of digital industrialisation, as digital technologies arise from technology fusion between different but closely complementary science and technology bases, and interdependent investments are needed to seize the digital dividend (Andreoni et al., 2021A). The more these investments are interdependent, the higher are barriers to entry. It is also driven by strategic engagements with domestic and foreign markets via large scale planning and intentional reduction in competition, conferring revenue-enhancing, cost-saving and monopoly power to enterprises – *value capture and extraction* (Hymer, 1970, 1972; Cowling and Sugden, 1987; Dunning and Pitelis, 2008).

Along this value dynamics spectrum – from value creation to value capture and extraction, there is however a tension resulting from the fact that the underlying drivers of these different value dynamics are intertwined. As a result, it is difficult to separate within large corporations and transnationals the extent to which a certain investment decision or market strategy serves one value purpose or the other. Investment decisions can be both the foundation of value creation and competitive advantage in innovative products, and also function to extract value by restricting competition in foreign markets.

The fact that multinationals control the digital technology space and that the investment threshold is very high makes developing and cumulating these digital capabilities challenging. Advanced economies have also remained the main host of inward cross-border Merger and Acquisition (M&A) investments in digital assets over the period 2013–2017, with the only exception being China and India among top 15 countries (UNCTAD, 2019, 2021). Most middle-income countries do not have large domestically owned multinationals able to invest substantial resources at early stages of technology development, scaling-up and commercialisation. Similarly, these countries lack public resources to compete with the two leading countries – USA and China – in basic and intermediate research for development of key enabling technologies of the digital platform economy.

3. Understanding and governing platform powers and capabilities: an analytical and policy framework

In today's monopoly capitalism, a fundamental challenge in understanding digital platforms is to appreciate their heterogeneity and their different ability to shape markets and business ecosystems. In this section we build a framework which enables us to navigate such heterogeneity, by categorising sources of power and rents and the ways in which platform functions impact on capabilities development and market access. On this basis we advance the idea of an 'entrepreneurial-regulatory state' as a way of integrating industrial and competition policies. The framework goes beyond the static and two-dimensional assessment of market power generally employed in antitrust policy. In competition assessment, market power is viewed as the ability of a firm to charge prices marked-up over costs and to act to an appreciable extent independently of its competitors, suppliers and consumers. This fails to capture the ability to shape markets in dynamic terms, taking into account the positions of other parties, in order to strategically influence the nature of interdependence from a position of economic power.

3.1 Nature of the platforms and heterogeneity

The main digital platforms can be distinguished in terms of their core functions (Jacobides and Lianos, 2021A). These functions are fundamentally different as they leverage different platform capabilities – hence different value creation dynamics – as well as being underpinned by different sources of platform power. Before delving into the functions-power-value triad in Sections 3.2 and 3.3, we propose to distinguish three main groups of platforms (see also Srnicek, 2016).

First, there are marketplaces and exchanges, including match-making between different groups of users (suppliers and consumers) which range from the 'sharing economy' of Uber and Airbnb, to media platforms selling content and advertising, and to e-commerce sites facilitating transactions on which commissions or intermediation margins are made. The data aggregation through the platform is presented as a joint or shared benefit widening access for suppliers and providing convenience for consumers. However, the data also provides control, rent extraction opportunities and market-shaping power.

Second, there are search and social networking platforms where users' attention is monetised through digital advertising. Users of the platforms generate a massive 'data

exhaust' of information on their characteristics and behaviour (Zuboff, 2019). While the platforms' role is apparently to act in the interests of the users in identifying the best search results or news, profit-seeking inevitably means users are the product – bought by those paying the platforms to influence people's behaviour, as consumers and voters.

Third, there are operating systems and software applications where fees can be charged to the users directly (e.g., for MS office, Epic Games and Spotify), and by the owners of the operating systems and the playstores to those providing the apps.

These groups of platforms are differentiated in the extent and nature of network effects, the multi-sidedness of the platforms and the role that the platform plays including in the data aggregation involved – that is, economies of scale and scope – and the nature of the user data. Thanks to 'network effects' (Katz and Shapiro, 1994), the more participants a digital platform is able to attract the higher the network economies the digital platform can benefit from. There are direct network effects when a platform becomes more attractive for one user with the growing number of users on the same side of the platform (e.g., typical for social networks and communication applications like Facebook). Indirect network effects occur when the platform becomes more attractive for one user group (e.g., advertisers) from an increase in the other platform side (consumers). The multi-sided nature of platforms means that the prices charged to one side have no necessary relationship to the cost of supply to that side. Network economies result from aggregating data from direct users and consumers, as well as in some cases their complementors. In all cases, the network effects mean a tendency to concentration.

The network effects impact on the extent of economies of scale and scope, and whether users can readily multi-home (i.e., relying on multiple networks) absent restrictions being imposed. For example, commercial radio stations are two-sided platforms bringing listeners and advertisers together, shaped by content. Consumer and advertiser switching and multi-homing are relatively easy. Little user data aggregation is intrinsically necessary to provide the service. However, most platforms can place various restrictions on different user groups to tie them into their platform by leveraging on the network effects and data aggregation. Rules can aid switching, as is the case with rules relating to bank clients' data being available via credit reference bureau which enable people to shop around for mortgages.

Very large economies of scale typically result from the fact that once initial fixed costs of building the platforms (and algorithms) have been covered, the marginal cost of adding participants is typically close to zero. Economies of scale in the digital platform economy can result in almost infinite rents. Substantial economies of scope result from costs declining with the increasing number of diversified goods and services offered on the platform.

The user data that is collated and analysed, whether this is directly through the platform functioning or as a by-product (data exhaust) of the platform use, is a further important dimension distinguishing the platforms.

These differentiating factors and the resulting heterogeneity among platforms, all impact on the extent of barriers to entry and the scope for potential competition – including from complementors becoming competitors.

3.2 *Anatomy of platform power: sources of power and rents*

In competition policy debates, the rise of the platform economy has opened the way to several contributions attempting to identify their sources of power and resulting rents.

The multi-dimensional nature of platform power has led to definitions of market power which move beyond the static assessment of monopoly power in a defined market. In the UK, for example, the concept of ‘Strategic Market Status’ has been proposed (UK DCEP, 2019). In Germany, the 10th amendment of the competition act in 2021 has set a standard of ‘paramount significance for competition across markets’ while proposed amendments in Greece (albeit not passed) built on the concept of a ‘position of economic strength’ (for a discussion see Jacobides and Lianos, 2021B). The EU’s Digital Markets Act refers to ‘designated gatekeepers’ in identified core platform services (Schnitzer et al., 2021). These approaches all set out criteria to distinguish the most powerful platforms and provide for their regulation.

Platform power potentially relates to the ability to shape markets. This is much more than the power recognised in competition law to exploit (through monopoly price mark-ups) or to exclude (where markets maybe foreclosed by a dominant firm to rivals) (Mondliwa et al., 2021). It extends to making the rules of the game itself, coding them in legal terms and directing how the games evolves, in an agenda-setting way. Overt coercion such as imposing restrictions on firms wishing to supply services via the platform may become less evident as participants accept the architecture as the norm (Pistor, 2019; Lianos and Carballa, 2021). Through shaping industry standards, regulations and best practices in conjunction with government bodies (e.g., in regard to rules for sharing data) the platforms have institutional power which influence the development of markets (Dallas et al., 2019; Kira et al., 2021). The rules and regulations shape markets beyond the immediate markets in which the main firms operate. The power may be exerted through government lobbying and funding of think tanks (Zingales, 2017). The large firms also have less perceptible influence on the norms which become embodied in standards and regulations through the way services evolve and their influence on our use of them (Stiglitz, 2017; Jacobides and Lianos, 2021A).

The extent to which the position of the firm is entrenched through the network effects and data aggregation is central to the power involved. A neo-Schumpeterian position is advanced by those such as Petit and Teece (2021) who argue that the characterisation of the large global platforms as ‘entrenched’ fails to take account of dynamic capabilities. In this view of the world, the continued position of the platforms likely reflects their leading capabilities and that the main platforms can readily be challenged, including by each other, in Schumpeterian competition for, rather than simply in, markets. In their interpretation, the rents earned by leading companies in many industries are not concerning as they are either Schumpeterian rents rewarding their dynamic capabilities and innovation, or Ricardian rents which reflect returns to scarce assets and incentivise increased supply. They also claim that barriers to entry are low as these are defined to ignore the strategic advantages which first-mover firms gain from network effects and data aggregation (Condorelli and Padilla, 2020).

Competition policy has evolved with the economics of information and game theoretic analysis of imperfect competition (Stiglitz, 2017; Fumagalli et al., 2018; Lancieri and Sakowski, 2021). It has moved beyond the Chicago School associated with Stigler which posited that the lead position of firms was simply evidence of their superior capabilities in contestable markets (Stigler, 1968). Instead, the ability of the dominant firms to engage in strategic conduct to undermine rivals and raise barriers is recognised (Cowling, 1982), and the implications of intrinsic market features (‘failures’) in financial markets and relating to consumer behaviour (Blaug, 2001). The implications of network effects, and economies of scale and scope mean markets tend to high

levels of concentration and lead firms can maintain their positions while blocking rivals which are potentially more efficient and innovative (Aghion et al., 2021).

The characteristics of digital platforms require a much wider rethink of competition and industrial policy. In view of disentangling the anatomy of platform power, we address the issues which are specific to platform power in digital platforms dynamic rivalry, and we advance a distinction between different types of rents and behaviour, which strategically shapes markets and their participants. Different value dynamics impinge on different sources of power and combinations of rents, as well as capabilities to perform functions that are truly value generating. Indeed, platforms can enable capabilities and provide market access to business enterprises. Figure 1 provides a first schematic of this complex set of relationships, and the fuzzy boundaries linking platform power and functions, hence the tension between value creation-capture-extraction.

With respect to the relationship between platform power and value capture-extraction, we distinguish between ‘monopoly rents’ à la Hymer/Cowling and ‘innovation rents’ à la Schumpeter/Penrose. The former rents arise from value extraction by restriction of competition via market shaping, while the latter are related to value creation-capture from innovation. We finally include ‘political rents’ as important sources of power, especially in a middle-income country context with strong clientelist networks and more limited power contestation in the political settlement.

As for the functions-value creation relationship, different digital platforms provide different enabling functions which are relevant for value creation processes in different economic sectors and activities. Different platforms can perform different functions – for example, from provision of services to consumers, to brand-building and routes-to-market, consumer data harvesting, data aggregation and renting cloud services. These functions have become major sources of value in key sectors, such as fast fashion, retailing, and tourism. In other sectors, such as advanced manufacturing and high-tech services, the key value functions provided by digital platforms are related to: harvesting industrial data for improving operation efficiency and providing digital solutions to business clients (as well as consumer data for complex product design); providing access to software and data analytics services; offering cloud and data centres services;

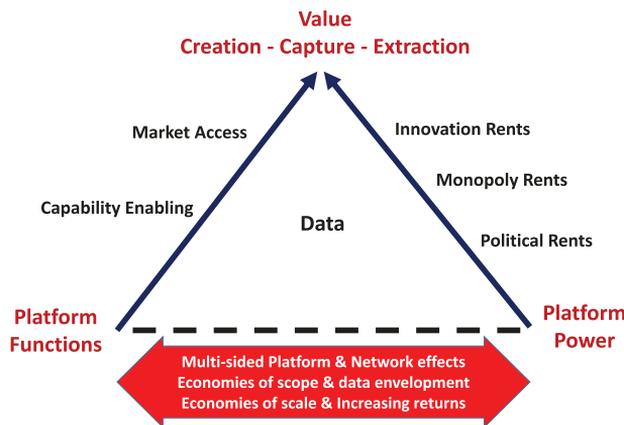


Fig. 1. Anatomy of platform power and the power-function-value triangle. Source: Authors.

and, transforming traditional goods into rentable services (so called ‘servicification’ of manufacturing) (Andreoni et al., 2021B).

The platform business strategies combine functions and power to maximise the network, scale and scope economies and the value extraction from them including the following key strategies:

- (i) introducing new transaction mechanisms more rapidly and at much lower cost than traditional firms controlling a linear series of activities (Zhao et al., 2020);
- (ii) pursuing winner-take-all strategies, leveraging large network and scale economies, including attracting users and consumers by strategic structuring of pricing on the different sides of the platforms (Teece, 2018), and fast scaling-up, especially in consumer markets (Sturgeon, 2021);
- (iii) pursuing economies of scope by aggregating data from multiple platforms as well as leveraging the data collected in a multi-sided market to enter a second multi-sided market – that is, ‘platform envelopment strategies’ (Eisenmann et al., 2011; Condorelli and Padilla, 2020);
- (iv) pursuing horizontal mergers and acquisitions, and integration into related markets, to capture data-driven scope economies, respond to demand-side product substitutability and complementarity and control key bottleneck assets in the data value chain (Teece, 2018; Jacobides and Lianos, 2021B; Rikap and Lundvall, 2021);
- (v) attracting complementary providers to increase the value for users and locking-in users in the digital platform (Kenney et al., 2019);
- (vi) setting and developing standards, thus, controlling interoperability and possibilities for modularisation in software technology and innovation (Teece, 2018) – including the development of boundary resources such as software development kits, application programming interfaces, and application contracting interfaces to be used by potential ecosystem complementors (Kenney et al., 2019; Sturgeon, 2021).

3.3 *Platform power, functions and value dynamics: an integrated analytical-policy framework*

We build on the triangle ‘value-functions-power’ of digital platforms (Figure 1) to advance new analytical-policy framework including two further dimensions of industrial and competition policy (including their integrated use in policy making and economic regulations) which impact on power and functions and have a combined effect on value creation and extraction (Figure 2). Each side of the framework represents a key relationship in the digital platform economy and links pairs of value, functions and power dimensions as well as industrial and competition policies. While all these dimensions are interrelated, arrows point to direct mechanisms linking pairs of dimensions.

Data are the main mediators of these relationships, as data are the main source of value creation, the main target of power control and value extraction and the main ingredient of platform functions (Jacobides and Lianos, 2021B; Kira et al., 2021). Digital platforms would not exist without data, and data would not be so valuable without platforms. The arrangements governing data collation and control are at the centre of the relationship between platform functions and platform power. The multi-sided network effects turn on the provision of data by users, which is then exploited by

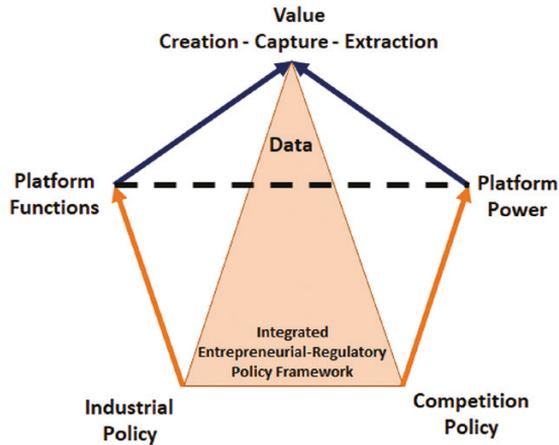


Fig. 2. *An integrated entrepreneurial-regulatory policy framework.*
Source: Authors.

the platforms for the provision of the services and at the same time for the extraction of value and shaping of markets.

The scale and concentration are necessary features of the digital platforms. Absent an appropriate rules-based regime (and notwithstanding various approaches to moral suasion) the inherent power will mean rent extraction by the platforms *and* political rents from the overwhelming ability to lobby that such concentration of wealth implies.

The concentration implies inter-industry coordination (Pitelis, 1991) as platforms recognise their mutual interest in avoiding rent-destroying competition (as with the Google agreements regarding the default browser on Apple phones), notwithstanding ongoing testing of boundaries and overlaps. There may also be the illusion of competing alternatives in the services being provided by the same platform, as Facebook and Google have each acquired large numbers of social networking businesses which were actual or potential competitors (Kwoka and Valletti, 2021). This is quite distinct from competition on a given platform between different providers of goods or services, which is shaped by the platform and governs the division of rents in the platform's favour. Three main considerations must be made here.

First, while there may be competing services offered on the large platforms, the incentives are clearly for the platforms to avoid head-to-head competition and be complementary so that people and businesses use a combination of platforms. For example, advertisers seek to have adverts on both Google, linked to the searches of the users, and on Facebook for display adverts linked to users' social media activity (CMA, 2020). The accommodation between platforms may be explicit such as has been documented in the payments Google makes to Apple for the default position of its browser on Apple devices (CMA, 2020).

Second, it is important to understand the role of data in the economic power of platforms and their ability to engage in envelopment of smaller rivals and complementors (Condorelli and Padilla, 2020). The result is the 'moligopoly' of substantial unilateral economic power on the part of a small number of platforms (Petit, 2020). The power of platforms implies a gatekeeper role, as has been referred to in some identifications of their position (Schnitzer et al., 2021). However, these framings fail to capture the

multi-dimensional nature through which the main platforms are shaping the world economy through their role in the *architecture* of markets (Lianos and Carballa, 2021).

Third the way in which platform power is exercised and value is captured differs across economic sectors and activities. For example, pricing in e-commerce, and discriminatory treatment in advertising from search and display adverts are key mechanisms to capture value from a specific set of functions offered to certain sectors, such as fast fashion and tourism. There are also cases of differential pricing and terms (e.g., access to consumer data) for those with countervailing power and bargaining capabilities (multinationals) compared with local businesses. In other cases, such as advanced manufacturing and services (e.g., machinery and health), platform power is exercised through the introduction of bottlenecks assets in software and digital interfaces. Moreover, by controlling foundational layers of digital platforms – technology and core infrastructural layers based on the nature of the platform (Sturgeon, 2021), as well as the computational algorithms – it is possible to extract value along the data value chain and all complementors operating within the ecosystem generated by the platform itself (Jacobides and Lianos, 2021B).

The framework provides a focusing device to study the implications of the monopoly power of digital platforms for middle-income and developing countries. Specifically, middle-income countries have complementors but are not likely to have rival large platforms in most, if not all, of the categories given that the global first-movers are already so huge. Some countries have substantial local or regional e-commerce or ride-sharing platforms, based in part on the geographic nature of the services. There are location-specific investments required in warehousing and distribution for e-commerce, and in local networks of drivers for ride-sharing, which mean local platform businesses can grow until they face the expansion of the international platforms. No middle-income countries aside from China have developed search, social networking or operating systems to rival the main platforms.

This means that the role of complementors which interface with, and layer on top of the main platforms, are critically important for middle-income countries. The impact of self-preferencing, such as by e-commerce platforms (where partner suppliers are favoured in the presentation and ranking of products) and Google in tourism, is not surprisingly what has been tackled first in a number of countries such as Turkey, India and South Korea. These cases address discrimination against local producers on international platforms; however, the discrete enforcement actions only scratch the surface of the challenges posed by platforms. Global digital platforms are built around evolving business models which combine and recombine functions in search of new value capture opportunities. For example, digital platforms can provide social media or e-commerce services while at the same time performing a data aggregation function for different markets.

4. Towards an entrepreneurial-regulatory state

4.1 Locating competition within an appropriate industrial policy

Approaching the policy challenge posed by the rising digital platform economy requires an industrial policy perspective into which competition policy is integrated as a way of refocusing the policy discussion, hence as a way of rethinking the role of the state in shaping and governing digital platforms for structural transformation. Industrial policy

has evolved as both a way of breaking a tendency towards uneven and dependent development intrinsic in capitalism, but also as a way of exploiting value creation dynamics and the transformative potential of industrialisation for bettering social welfare (Cowling and Tomlinson, 2011; Chang and Andreoni, 2020). The changes in industrial policy partially reflect its evolution in the practice and its transformative scope in different country contexts (Peneder, 2017; Chang and Andreoni, 2020). In the East Asian Miracle debate, throughout the 1980s and 1990s, industrial policy referred to ‘selective’ industrial policy, ‘sectoral industrial policy’ or ‘targeting’ – namely, a policy that deliberately favours particular industries/sectors over others, against market signals. It usually (but not necessarily) aims to enhance efficiency and promote productivity growth, for the whole economy as well as for the targeted industries themselves (Johnson, 1982; Amsden, 1989; Wade, 1990; Chang, 1994; Cowling and Sugden, 1992, 1998).

Over the 1990s and 2000s, especially among advanced economies, industrial policy was increasingly associated with innovation policy and regional industrial policy, hence policies that promote competitiveness and spatial distributional outcomes (Cowling and Sugden, 1999; Pitelis, 2006). In this context, especially within the EU Single Market Framework, industrial policy was replaced by innovation policy and subsumed within competition policy (Pelkmans, 2006) with an emphasis on horizontality (hence, non-selectivity) and a level playing field (hence, promotion of competitive markets). The entrepreneurial spirit of industrial policy – that is, shaping industries and markets, and directing change – was replaced by the idea of a regulatory and purely market-enabling role of the state.

In the aftermath of the financial crisis, however, industrial policy witnessed an expansionary phase again. Among advanced countries, industrial policy became the key policy tool to drive a structural rebalancing of de-industrialised economies like the UK and the USA, with a strong emphasis on multi-layered, matrix-types and place-based smart specialisation approaches (Bianchi and Labory, 2011; O’Sullivan et al., 2013; Bailey et al., 2015; Andreoni et al., 2018). Across emerging and developing countries, industrial policy was also re-linked to structural transformation (Cimoli et al., 2009; Stiglitz and Lin, 2013), however the latter became increasingly qualified in terms of inclusiveness and sustainability (Rodrik, 2014; Oqubay et al., 2020) and more recently resilience (UNIDO, 2022). Since 2015, across all countries, we have also witnessed an increasing emphasis on digitalisation and global industrial reconfiguration along value chains and platforms, hence the need for digital industrial policy (Bianchi and Labory, 2018; Oqubay et al., 2020). It is within this context that industrial policy and competition policy have started a new dialogue.

At this critical industrial-competition policy interface, an industrial policy perspective helps in reframing the complex policy issues governments are grappling with around the problems of *value creation* as well as *sustainable capture of co-created value* (Bailey et al., 2018). The government needs to use regulatory and competition policy levers as part of its strategic engagement with digital platforms to increase domestic value addition and to address the middle-income technology trap challenges (Andreoni and Tregenna, 2020). The government also needs to make sure that domestic players are involved in value creation entrepreneurial processes and that the value that is co-created domestically across multi-sided platforms and ecosystems is also captured. In this respect, industrial policy is concerned with domestic *value creation* and balancing the *power* of digital platforms, which intersects with competition policy’s main concerns, in what we frame as an entrepreneurial-regulatory state.

An industrial policy perspective for an entrepreneurial-regulatory state points to the importance of identifying entry points in multi-sided and multi-layered digital platforms for local complementors, that is, firms which can connect via platforms to link their modular offering into wider national and international markets (Sturgeon, 2021). Data on customer preferences are important for design and marketing, with these services being complements to manufacturing (Mayer, 2021). Industrial policies are essential to support investment in the digital capabilities and infrastructures which are critical for domestic companies to meet the requirements to create and capture value in the evolving global digital platform economy. These capabilities include skills in software design, coding and data science. Indeed, while countries can benefit in static terms from access to the services and functions provided by global digital platforms, the ‘dynamic digital dividend’ is the one which can deliver long lasting transformative economic results and increasing value returns. But, this long-term dividend calls for commitment of financial resources, their strategic control and policy directionality. Thus, it requires industrial policy.

Finally, industrial policy is about strategic selectivity. This means designing policies taking full account of the heterogeneity of digital platforms (their functions and power control mechanisms). For example, governments in middle-income countries can target data aggregation functions of global digital platforms in certain sectors (e.g., fast fashion), in view of opening new routes to markets for their companies, while simultaneously enforcing strong data ownership and localisation regulations in other sectors (e.g., health) in view of supporting the emergence of domestic platforms. In other sectors (e.g., advanced machinery) governments can exploit the multi-layered nature of industrial platforms to give domestic companies opportunities to innovate in software design domestically, while keeping digital platforms interfaces and standards open.

The adoption of an industrial policy approach to the challenges and opportunities offered by the global digital platform economy is not a substitute for appropriate competition policy. Indeed, as the history of successful industrial policy demonstrates, countries which were successful in escaping the middle-income technology trap like South Korea were exactly those that relied on a complex policy mix aligning industrial and competition policies. Protectionism and competition were promoted in parallel and, sometimes, sequentially (Stiglitz, 1996). Ensuring competitive discipline in export promotion integrated with infant-industry policies to build capabilities was a key aspect of industrial policy in East Asia (Chang, 2011).

Aiming for ‘optimal competition’ means balancing between ensuring effective rivalry while at the same time allowing for the achievement of dynamic economies of scale and scope (Amsden and Singh, 1994; Singh, 2003). If the target is dynamic efficiency – thus, an industrial policy target – the degree of competition a government might want to accept might be different from the one allowed within standard competition authority’s rulebooks (Sidak and Teece, 2009; Roberts, 2013).

An entrepreneurial-regulatory state is required to balance competition and cooperation in many areas of a data-based networked economy, recognising that in some cases less competition (or even no competition) is necessary to concentrate resources and generate network effects. The balance will depend on the stage of industrial development, the world configuration of industries, the context of the economy in question and the role of the state (Budzinski, 2008). For example, the Korea Fair Trade Commission’s objectives have long incorporated the balancing of competition and industrial development such that effective competitive discipline is part of industrial

policy (Fox, 2003). The importance of the large industrial conglomerate groups (i.e., *chaebol*) was recognised, along with the need to maintain effective competitive rivalry between them and in international markets in order to continue to spur effort, creativity and innovation. In Japan, there has been a similar recognition of competition as a dynamic process. The changes to laws and regulations being proposed around the world will enable competition authorities to set rules for platforms to balance the benefits of the platforms and the gains from, for example, ensuring interoperability and non-discriminatory terms of access. These need to be part of an industrial policy which is oriented to building local capabilities.

4.2 South African case

South Africa is an interesting example of a middle-income country as it has placed substantial weight on competition policy to address the power of large firms in a liberalised economy and has emphasised the potential gains from digitalisation (Roberts 2020B; Andreoni et al., 2021B). It has, however, largely failed to come to terms with ensuring dynamic rivalry for building diversified industrial capabilities and highlights the challenges of the platform economy and the need to think in terms of building an entrepreneurial-regulatory state (Andreoni and Roberts, 2020).

Digital platforms have enabled substantial value creation for South African businesses in realising benefits from the Industrial Internet of Things (IIoT) and through reaching a much wider set of customers, locally and internationally, than they would otherwise be able to. Search, social networks and digital advertising have become essential for sectors such as tourism where the global platforms provide avenues for South Africa's highly developed tourism industry to market a diversified destination to global tourists. In industry, there are islands of advanced capabilities in areas with an existing strong capability base such as in mineral processing, where lead firms are using digitalisation together with machine learning for condition monitoring and predictive maintenance, as well as in high value fruit production (Andreoni et al., 2021B).

By comparison, e-commerce is relatively undeveloped in South Africa and is led by a local business Takealot, owned by the Naspers group. In addition, in healthcare South Africa has a local platform (Discovery) which has built on a dominant position through innovation to shape the markets, illustrating the potential where there is a user base and valuable data which can be aggregated South African Competition Commission's Healthcare Inquiry (Competition Commission South Africa, 2019, p. 126).

President Ramaphosa of South Africa observed that '[e]conomic growth will be driven by the leaner and more adaptable small- and medium-sized businesses of the future. Industry 4.0 will enable us to "leapfrog" outdated processes and technologies in favour of newer, more sustainable ones' (Ramaphosa, 2020). However, the examples of relative success are exceptions which prove the rule. While the digital platforms hold the potential for greater international integration, there is the danger that the relative advantages will be greater to operations which are already in the lead and, although there are exceptions, these are not in South Africa or similar middle-income countries.

South Africa has seen a hollowing-out of the industrial base overall. In areas such as fast fashion, weak local capabilities mean that the South African industry does not have a good base from which to build (Andreoni et al., 2021B). While growth opportunities may well exist, a digital industrial policy is required to build the capabilities in local ecosystems, in which regulation of digital platforms needs to play an important

complementary role, if countries are to by-pass the middle-income technology trap. In South Africa, the policy framework for digitalisation as set out in the 4IR Commission, is, however, not embedded in an industrial policy approach, nor is it effectively articulated with competition policy. It has built regulatory institutions without locating them within an industrial strategy which would see rule-making for market-shaping in an entrepreneurial way.

4.3 Policy alignment for an entrepreneurial-regulatory state

In today's digital platform economy, this *industrial policy-competition policy alignment* depends on recognising the network, scale and scope economies, the appropriate rules for fair access and interoperability and the role of effective rivalry (Sidak and Teece, 2009; Roberts, 2013; Schnitzer et al., 2021). Making the right balance between competition and cooperation in many areas of a data-based networked economy is challenged by the fact that, in some cases, less competition (or even no competition) is necessary to concentrate resources and generate network effects. This must engage with concerns about the appropriability challenges companies face, while recognising that public investments in the enabling technologies should not be captured by private interests (see the debate between Teece, 2018 and Nelson, 2018).

Recognising the dynamic nature of value creation and extraction in evolving business models enabled by digital platforms means rethinking the role of the state and regulation. An 'entrepreneurial-regulatory' state is required to support local capabilities in a world of digital platform competition. This differs from a state with separate regulatory bodies on sectoral lines and separate government bodies to address market failures in areas such as development finance, research and development and skills. An entrepreneurial-regulatory state recognises the central role of data which is collected and analysed by platforms cutting across consumer search, payments, finance, communications and media. The state needs to be entrepreneurial in being flexible, responsive and analytical. It is regulatory in making, adapting and applying rules to ensure open markets that reward innovation, effort and creativity.

Regulatory powers are necessary to set and enforce rules which take into account the entrenched dominant positions of the platforms, the intrinsic network effects, and importance of data as a competitive asset which can be leveraged across adjacent markets. This involves rule-making rather than simply rule-enforcing, considering the market-shaping implications of platforms and how they are governed, to reward value creation. The state has an expansive industrial policy role to play in building cross-cutting digital capabilities in basic, intermediate and advanced fields. These fields are increasingly interdisciplinary as data science and behavioural analytics cut across traditional knowledge areas in project-based research missions. The policy support includes ensuring investment in the necessary digital infrastructure and data centres. The combination of rules and enabling measures should be oriented to digital platforms offering domestic industrial businesses access to software and data analytics, cloud services, and customised innovations for them to build modular advanced manufacturing systems and open innovation in varieties of business models (Sturgeon, 2021).

Competition and market authorities under appropriate enabling legal regimes can evaluate arrangements and address conduct which may unfairly disadvantage local businesses. These arrangements include those which are already being addressed around the world such as self-preferencing by platforms of their international partners, and

the imposition of ‘most favoured’ nation clauses, which prevent businesses from having alternative routes to market (Cremer et al., 2021; Heidhues et al., 2021). Competition inquiries can make wider recommendations for realising the benefits from digital platforms, including in opening-up markets with strong domestic incumbents (e.g., in retailing) and providing alternative routes to markets for smaller and more innovative local businesses. These can encompass data localisation policy, differentiating types of data according to the scope for data aggregation and network effects using, for example, local licencing to ensure access to data and a level playing field in competition of international platforms and local businesses.

Measures contemplated under stricter competition regimes on interoperability, open standards and modular interfaces can support domestic businesses targeting value creation and capture opportunities at higher level platforms and in end-user customisation. The approaches differ across countries, while recognising that antitrust enforcement is too slow and new tools and tests are required to capture platforms’ power (Chopra and Khan, 2020). For example, in Germany, the Ordoliberal approach to competition law, concerned with the dangers of concentration of economic power for its possible impacts on freedom, has seen the ‘paramount significance for competition across markets’ test put forward for platforms. In the UK, market inquiries have been used to address markets which are not working well, and this has seen proposals for a ‘Strategic Market Status’ to be applied to platforms (Fletcher, 2022).

Addressing these competition challenges imply collapsing the boundaries between *ex ante* economic regulation and *ex post* competition enforcement, as the rules need to evolve with analysis of evolving market power and the level of discipline required. Rules are required for data access, considering incentives for data gathering and analysis and regulate the access arrangements to make them work in practice. The regulation of data is integral to assessment of the wider arrangements on the part of dominant platforms, balancing the potential negative effects of restrictive terms on competition against the efficiency rationales for the arrangements. Healthy, open and competitive markets therefore require an entrepreneurial-regulatory state.

5. Concluding remarks

The rising digital platform economy requires a fundamental rethink of the role of the state regarding industrial and competition policies if they are to support value creation and engage with corporate power. This is especially pertinent in countries facing middle-income technology and industrial development traps under uneven development in the era of digital platforms. Understanding the implications of digital platform power requires assessing the complex inter-relationships in the triangle of the functions of multi-sided platforms, their economic power and the value creation, value capture and value extraction by and through, the platforms.

The network effects, combined with big data aggregation and analysis by the platforms, are central to both the value generation and the extreme levels of concentration and market-shaping positions which the large platforms have, and which determine capabilities and market access along with the division of rents. We consider the heterogeneity and dynamic nature of the digital platform dynamics to build on the insights of Hymer’s efficiency contradiction and Cowling’s theory of monopoly capitalism and how it may be overcome. This leads us to propose a conception of an entrepreneurial-regulatory state. Such a state must combine the tools of industrial and competition

policy to strike the appropriate balance between the dynamic scale and scope economies of platforms, and the imperative of setting rules on platform power to ensure optimal competition for local value capture and capabilities formation.

The power of the platforms and the need for appropriate rules, institutional and governance arrangements have been recognised and reflected in proposals for competition law to recognise the large platforms ‘strategic market status’ and ‘outstanding relevance across markets’. These proposals, however, do not take into account the central role of the platforms in framing industrial development and the implications for countries seeking to build a broad capabilities base, including through local complementor and competing businesses to the platforms. It is essential that the rethinking on competition law and policies is combined with digital industrial policies for investment in basic and intermediate digital capabilities and broader access to high-quality digital infrastructures.

We have argued that at the heart of the integration of industrial and competition policies for appropriate market-shaping in the digital platform economy is the anatomy of platform power and the implications of big data. We propose a framework through which uneven development can be analysed and the ‘middle-income technology trap’ maybe avoided by engaging with the growing importance of global digital platforms, rather than the trap being reinforced by the platform power.

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