European Commission

Quarterly R&I literature review 2022/Q3

The impact of market power on R&I

R&I PAPER SERIES
LITERATURE REVIEW

Research and Innovation

The impact of market power on R&I

European Commission
Directorate-General for Research and Innovation
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Literature review

2022 Directorate-General for Research and Innovation EN

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INTRODUCTION

This literature review is developed by the 'Economics of R&I' team of the Chief Economist unit of DG Research and Innovation. It provides a brief summary of a selection of recent publications on R&I economics and policy. Contributors for this edition: Valentina Di Girolamo, Alessio Mitra, Océane Peiffer-Smadja, Julien Ravet (team leader), Jan-Tjibbe Steeman.

Competition law is a key element of ensuring well-functioning markets and innovation. Markets need rules to operate well and to be competitive. Competition law helps to foster free and open competition. The functioning of markets is closely interlinked with innovation performance. Non-competitive markets, with barriers to starting and operating a business, hamper the innovation potential of economies.

At the same time, innovative activities require adequate protection through intellectual property rights. Although intellectual property can be overused and misused, it remains an important pillar of successful innovation policies, as without the legal monopolistic incentive given to firms thought it, incentives to invest in risky innovative activities are lower.

Competition policy has contributed to preserving and fostering the EU's economic prosperity. Competition enforcement through law and other competition-enhancing measures have served European consumers, citizens and businesses, by empowering them to make choices in the marketplace and benefit from innovative products and services at affordable prices.

The European Single Market, together with the continuous use of all competition instruments (merger law, antitrust law and state aid control) will be crucial in leading EU industries toward the twin transitions while allowing consumers a fair share of the resulting benefits. EU competition policy helps to set the right incentives for companies to use resources efficiently, avoid stranded assets and innovate their production processes towards greater sustainability. Indeed, regulators need to remain vigilant, including in light of the increasing market power of some firms and the acceleration of this trend in the digital economy.

This literature review looks into different aspects of market concentration and R&I, investigating the current trend of **rising market concentration**, highlighting the **main drivers** and **consequences for innovation outputs**.

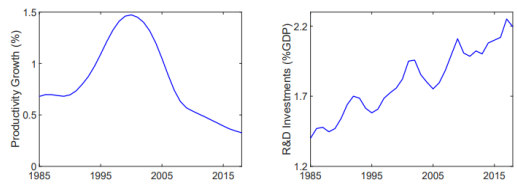
MARKET POWER AND THE INTANGIBLE ECONOMY

Maarten De Ridder (2019, revised in 2021). Market Power and Innovation in the Intangible Economy, Cambridge-INET Working Paper Series

Messages	**1. The productivity slowdown can be explained via specific features of intangibles assets. 2. This rise of intangibles changes both the rate and the efficiency in which firms engage in R&D, with high-intangible firms becoming more efficient in using intangibles, and being able to set higher markups. 3. Overall R&D increases, but becomes less effective because it is concentrated among a smaller number of firms, and innovators are unable to beat high-intangible incumbents.**

This paper studies the relation between productivity growth, business dynamism, market power and R&D investments. An endogenous growth model is constructed to quantitatively analyse the effect of a rise of intangibles (inputs that are used in production, but that are not physically embodied, such as software). Intangibles change the relationship between profitability, firm-level innovation and aggregate growth because intangibles have two features: they are scalable (duplicated at close-to-zero marginal cost), and firms differ in the efficiency with which they deploy them.

Figure 1. Trends in Productivity Growth and Research & Development



(a) Productivity Growth (b) R&D Investments

Notes: Figure 1a plots annual productivity growth from the Fernald series (FRBSF). The plot is smoothed using an HP filter with an annual smoothing parameter of 100. Figure 1b plots private R&D as a percentage of GDP. Data is from the BEA NIPA tables.

The model is estimated using French and U.S. administrative and survey micro data, from 1994-2016 and 1997-2015 respectively. The study shows that the rise of intangibles changes both the rate and the efficiency in which firms engage in R&D, explaining the trends of rising R&D expenditures and the slowdown of productivity growth seen empirically in the last decades. The empirical estimates show an initial boost in productivity due to the rise of intangibles (entry of high-intangible firms). The rise in productivity is not matched by wages because the high-intangible firms, becoming more efficient, can set proportionally higher markups (via market power). After the initial boost, a significant decline in productivity growth is estimated, with an estimated decline in long-term productivity growth of 0.4 percentage points for the U.S. and 0.2 percentage points for France. Overall R&D increases, however it becomes less effective because it is concentrated among a smaller number of firms, and innovators are unable to beat the high-intangible incumbents. Additionally, the empirical results show an increase in markups (market power) and a decrease in market dynamism, in line with empirical trends of the last decades.

From a policy perspective, it is useful that the study provides a (quantitative) explanation of the productivity slowdown of the last decades, despite the increase in overall R&D investments. As firm-level innovation is concave in spending, the concentration of R&D negatively affects overall growth. Policies such as R&D subsidies should therefore be designed with heterogeneity in firm-level incentives in mind.

TECHNOLOGY AND MARKET DOMINANCE

De Loecker, J., Eeckhout, J., & Mongey, S. (2021). Quantifying market power and business dynamism in the macroeconomy (No. w28761). National Bureau of Economic Research.

Messages	**1. Technological and market structure changes have positive welfare effects because of reallocation of business towards more productive firms in the US. 2. However, these positive effects are more than offset because of negative externalities resulting from the more productive firms using their market dominance to extract rents from customers.**

The paper looks at the relation between key secular macroeconomic trends and the presence of market power, for the US economy. In particular, the paper uses trends in labour market dynamism and the cost structure of firms to investigate the causes behind the increase in market power, and assess the consequences of these changes for welfare, employment and output.

The empirical strategy is a quantitative framework designed to account for both the causes and consequences of market power via the setup of a general equilibrium model with oligopolistic output markets. The model is run using data from 1980 to 2016, retrieved from a combination of Compustat and Census Business Dynamics Statistics (BDS).

The framework distinguishes two channels as sources for market power: 1) Technology, via changes in productivity and the cost of entry. This can have a negative impact on welfare because a firm that is more efficient can become dominant, gain market share, and extract rents. 2) Market structure, via changes to the number of potential competitors. If there are fewer competitors, firms can set higher markups, leading to deadweight loss from market power.

The results from the econometric estimations show that both channels are relevant to account for the data. Additionally, positive welfare effects are found because technology and market structure changes reallocate business towards more productive firms. However, overall welfare is 9 percent lower in 2016 than in 1980 because of the offsetting negative effects resulting from efficient firms using their dominance to extract rents from the customers. These two opposing welfare effects, resulting from market power, give important policy considerations.

A likely objective from an overall welfare perspective is to keep the positive welfare gains resulting from more efficient firms, while reducing the negative welfare effects resulting from firms using their market power to extract rents. However, this is not simply achieved through splitting up firms because this would destroy the positive gains.

ACQUISITIONS, COMPETITION AND INNOVATION

Kamepalli, S. K., Rajan, R., & Zingales, L. (2020). Kill zone (No. w27146). National Bureau of Economic Research.

Messages	**1. Acquisitions by digital platforms may distort competition and prevent innovation, as they can discourage new entrants thereby creating a "kill zone" around their areas of activity. 2. Limiting acquisitions through merger controls may represent a solution to such distortion, but it is sub-optimal from a welfare point of view. 3. Increasing interoperability represents a good policy alternative to reduce the incumbency advantage from network externalities and switching costs.**

The paper investigates whether acquisitions done by large digital platforms create a "kill zone" around their area of activity, deterring future investments, innovation and new entries.

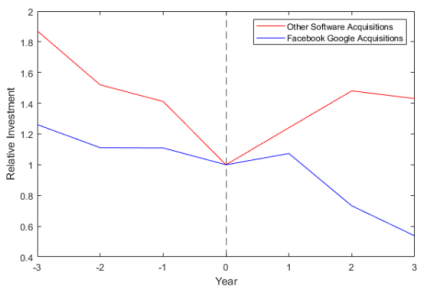
The standard economic argument that acquisitions can incentivize new entries relies on the idea that the acquisition price represents an adequate compensation for innovation. In case of digital platforms, this may not hold due to the specificities of the digital economy. Using information on the number of deals and venture capital investments in a given sector around the time Facebook or Google announced major acquisitions in that sector, the authors observe a significant reduction in both VC investments (over 40%) and number of deals (over 20%) in the three years following the acquisition.

To explain such empirical findings, the paper develops a theoretical model of platform competition with several new features. First, the platforms attract, on one side, advertisers, while, on the other side, provide customers a service for free. Hence, there is no price competition on the customer side. Second, some customers are subject to switching costs when moving from one platform to the other. Third, the model accounts for the presence of important network externalities on the customer side of the market (i.e., ordinary customers benefit from the increase in the number of apps and customers that are on a platform).

Overall, the authors show that the mass of early adopters offers a signal about the quality of the new platform, thereby determining its adoption by other customers. Additionally, the mass of early customers creates network externalities for ordinary customers, who have to choose whether to adopt the new platform or not. This creates a "kill zone" in the start-up space, as network externalities make new ventures less profitable and not worth funding.

From a policy perspective, antitrust policy could play a role by imposing restrictions on mergers. Nevertheless, such type of interventions come along with several costs in terms of market fragmentation, lower network externalities. A potential solution is to increase interoperability, so that the new entrants are enabled to obtain the incumbent's network externalities, and the return to innovation is higher.

Normalized relative investment before and after an acquisition



KILLER ACQUISITIONS AND INNOVATIVE FIRMS

Cunningham, C., Ederer, F., & Ma, S. (2021). Killer acquisitions. Journal of Political Economy, 129(3), 649-702.

Messages	**1. Incumbent firms may acquire innovative firms solely with the purpose of discontinuing the acquired innovation projects and pre-empt future competition. 2. In the US pharmaceutical market, such type of acquisition accounts for around 5.3%–7.4% of acquisitions. 3. In the areas outside of antitrust scrutiny, acquisitions aimed at preventing future innovation are more common.**

The paper studies both theoretically and empirically the phenomenon of killer acquisitions, i.e. those acquisitions in which a company acquires another with the sole objective of eliminating potentially promising, yet likely competing, innovation. To do so, the authors develop a simple theoretical model that combines endogenous acquisition decisions, innovation choices, and product market competition. At the same time, an empirical analysis is performed to confirm the theoretical findings.

The authors collect detailed development information on more than 16,000 drug projects originated by more than 4,000 companies in the past two-and-a-half decades, following each drug from initiation, tracking the relevant acquisition events and the cases of overlapping drug research. The econometric analysis uses project-year panel data to estimate the impact of acquisition for projects that are overlapping with the acquirer research portfolio on the probability of post-acquisition development activity of such projects.

The theoretical model shows that the incumbent disincentive to innovate (driven by his pre-invention monopoly profits) can be so strong that an incumbent firm may acquire an innovative start-up simply to shut down the start-up's projects and thereby stem the "gale of creative destruction" of new inventions. Empirically, it is found that projects acquired by an incumbent with an overlapping drug are 23.4% less likely to have continued development activity, compared to drugs acquired by non-overlapping incumbents.

The analysis also uncovers some heterogeneity of the identified effects. Indeed, the decrease in development probability for acquired overlapping projects is stronger in markets with low competition. At the same time, the decrease in development rates is concentrated in overlapping acquisitions for which the patent on the acquirer's overlapping drug is relatively far from expiry, implying that incumbents strategically prioritise the acquisition of drugs that would hamper the most their legally guaranteed monopolistic profits.

Given the presented findings, the authors call for rigorous antitrust policy capable to scrutinise the acquisitions on corporate innovation, in particular when such acquisitions plausibly prevent the development of future competing products and technologies.

Overlapping Acquisitions and Project Development

	Development Event = 1					
	(1)	(2)	(3)	(4)	(5)	(6)
I(Acquired) × *I*(Post) × Overlap	−.037***	−.033**	−.029*	−.041**	−.043**	−.054**
	(.013)	(.014)	(.015)	(.019)	(.021)	(.024)
I(Acquired) × *I*(Post)	−.020***	−.016**	−.017**	−.024**	−.018	−.018
	(.006)	(.007)	(.009)	(.010)	(.011)	(.013)
I(Acquired) × Overlap	.004	.009	.026**			
	(.008)	(.009)	(.011)			
I(Acquired)	−.002	−.004	−.011			
	(.004)	(.005)	(.012)			
Before(−3) × Overlap						−.031
						(.032)
Before(−2) × Overlap						.012
						(.032)
Before(−1) × Overlap						−.040
						(.030)
Before(−3)						.015
						(.017)
Before(−2)						.029
						(.017)
Before(−1)						−.003
						(.016)
Observations	143,569	143,569	143,569	143,569	134,662	143,569
R^2	.038	.252	.289	.366	.662	.370
Vintage FE	Y	Y	Y			
Age FE	Y					
Age × TC × MOA FE		Y	Y	Y	Y	Y
Originator (target company) FE			Y			
Project FE				Y	Y	Y
Propensity score reweighted					Y	

COMPETITION IN DATA RICH MARKETS

Krämer, J., & Schnurr, D. (2022). Big data and digital markets contestability: Theory of harm and data access remedies. Journal of Competition Law & Economics, 18(2), 255-322.

Messages	**1. In order to sustain innovation and avoid long-term monopolization, it is vital to ensure contestability of these markets. 2. A few data-rich firms have gained prominent positions and large user bases across horizontal and vertical markets. 3. There are different policy options that can be conceived to mitigate the market power of data-rich incumbents and to safeguard the openness of the digital ecosystem for new entrants.**

This paper explores several policy options that can be conceived to mitigate the market power of data-rich incumbents and to safeguard the openness of the digital ecosystem for new entrants.

The authors explain that the richness of data can lower the cost of innovation, as it is possible to develop better models and products having more information and less costly processes. At the same time, companies with many customers and the data collection infrastructure already in place will find easier to develop new products or invade close markets, compared to new entrants that lack the customer base feeding with daily new data. The advantages given by data to the incumbents is called Data-Driven network Effects. Data-Driven Network Effect are associated with high entry barriers for newcomers, yielding to a lack of innovative pressure for the incumbent firms.

Data driven network effects can also generate domino effects, as data-rich firms may also venture into other data-driven markets more easily. For example, the data skills and infrastructure that Amazon has acquired to support its e-commerce activity allowed it, among other things, to venture into the streaming video market, where it could make use of its data centres, and its ability to recommend suitable content.

Looking at such regulations, the authors argue that preventing combination of data originating from different services, shorter data retention periods, could reduce the efficiency of the incumbent in creating value from data, but it would not foster competition and entry in digital markets. On the other hand, forcing data-rich incumbents to provide consumers with the possibility to consent to a continuous, real-time data portability, would benefit innovation and entry by new market players.

MARKET RESPONSE TO INNOVATIVE DISTRUPTORS

Chang H-H., Sokol D. (2022). How incumbents respond to competition from innovative disruptors in the sharing economy - The impact of Airbnb on hotel performance. Strategic Management Journal. Vol 43 (3). Pp. 425-446

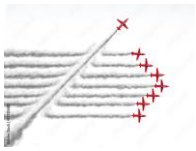
Messages	**1. The entry of an innovative disruptor such as Airbnb on the market has different impacts depending on the segment of the market for which it competes (low-quality or high-quality hotels in that case). 2. Incumbents may react swiftly with price reduction or in the longer run with product differentiation.**

Using the case of Airbnb, the paper investigates how disruptive innovators affect incumbents in traditional markets. The analysis studies the impacts of Airbnb on hotels' demand and price and non-price response strategies in Taiwan.

The authors use a panel dataset that compile the population-based administrative profile of tourist hotels with their characteristics, including number of rooms, number of stars, etc. using Taiwanese government's data, and the number of Airbnb listings using web crawler. The study period ranges from February 2013 to September 2017. In total, they account for 129,120 listings on the Airbnb platform during that period and they gather data on 128 tourist hotels with 29,353 rooms.

The methodology used is a fixed-effect model to estimate the hotel occupancy rate, price, investment in service quality, and revenues controlling for the number of Airbnb listings, hotel characteristics, year-month specific and individual hotel fixed effects.

The authors demonstrate that the impact of Airbnb on hotel incumbents is heterogeneous and depends on hotel quality. All other factors equal, 1,000 Airbnb listings decreases the occupancy rates of tourist hotels by 3.9%, i.e. approximately an equal reduction of 797 hotel rooms per month in Taiwan. While the decrease for high-quality hotels is 2.2%, it is 5.7% for low-quality hotels.



On the strategies of hotels to adapt to this disruptive innovator's entry on the market, the responses also depend on the quality of the hotels. Low quality hotels are more likely to adopt a price-cutting strategy, whereas high quality hotels invest more in quality and management.

Low-quality hotels respond to Airbnb earlier than high quality hotels. In the first three years after the entry of Airbnb, low quality hotels reduced their price by 4.1% more than high-quality hotels. In contrast, high quality hotels respond more slowly to the entry of Airbnb, and with product differentiation strategies and investment in their own business, notably to connect with loyal customers.

In conclusion, the impact of the entry of an innovative disruptor on incumbents, such as Airbnb on tourist hotels, leads to price cutting strategies for those incumbents that compete directly with the innovator and have not the resources to invest and engage differently. On the other hand, a product differentiation strategy is implemented by incumbents that aim at repositioning themselves and can afford to invest.

IMPORT COMPETITION IMPACT ON INNOVATION

Nykvist B., Maltais A. (2020). Too risky – The role of finance as a driver of sustainability transitions. Environment Innovation and Societal Transitions, Vol 42

Messages	**1. Innovators perform better in a context of a competitive shocks. 2. Product innovation incentives are stimulated by competition while process innovation incentives decline. 2. Confronted with market competition shock, firms that pursue process innovation strategies exhibit higher profits if they survive, but are more likely to exit, while firms that pursue product innovation strategies perform better with no notable change in exit probability.**

The main objective of this paper is to estimate the causal effect of increases in Chinese import competition on innovation strategy, innovation outcomes, and performance for Canadian firms.

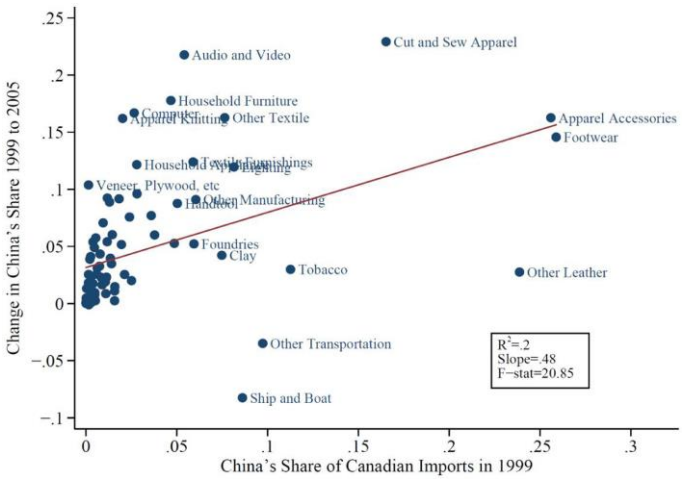
The authors use a difference-in-difference strategy using cross-industry differences in the change in Chinese import shares to identify the effects of competition on Canadian firms. They also run several regressions with exits and profits as outcome variables introducing an interaction coefficient that identifies the innovation and performance response.

The dataset is a Canadian firm-level panel on strategy choices, innovation outcomes, exit and performance with five waves from 1999 to 2005 based on a national survey, validated with administrative tax records. They focus on manufacturing since Chinese exports are heavily concentrated in this sector, starting with 1,370 firms, of which about 900 survive until the end of the sample period. Strength of Chinese import competition is measured using the share of Chinese imports over total imports.

First, they demonstrate that Chinese competition has a strong effect on the exit of Canadian firms, leading to adjustments of their strategies.

Second, they find that the innovation response of firms depends on the type of innovation. Canadian manufacturing firms reduced process innovation activities, while they increased product innovation. Furthermore, firms that pursue process innovation strategies exhibit higher profits than non-innovative firms if they survive, but are more likely to exit in response to Chinese competition. In contrast, firms that pursue product innovation strategies perform better than non-innovative firms if they survive with no notable change in exit probability.

They conclude that, on average, product innovation incentives are stimulated by competition while process innovation incentives decline.



FIRM SIZE, COMPETITION AND DIGITALIZATION

McMahon, M., et al. (2021), "Scale, market power and competition in a digital world: Is bigger better?", OECD Science, Technology and Industry Working Papers, No. 2021/01, OECD Publishing, Paris

Messages	**1. Digital technologies are typically characterised by large fixed costs, low marginal costs, and significant complementarity to human capital and other intangible assets. 2. Firm size is positively related to mark-ups and productivity, and this relationship has strengthened over time, particularly in the digital intensive sectors. 3. Complex technologies requiring large amounts of data and highly specialised skills may be easier for large firms to develop, potentially fostering inequality.**

The paper studies empirically the phenomenon of markups and productivity divide between larger and smaller firms, as well as its linkages with digital technologies such as big data and artificial intelligence. The hypothesis of the paper is that due to the large fixed costs, and low marginal costs, embedded in the use of digital technologies, larger companies will find easier to scale up production, boosting market concentration.

The analysis employs firm-level data covering 26 OECD countries obtained from the Orbis database. To compute the digital intensity of sectors, the authors use different indicators such as the share of ICT tangible investments, stock of robots per hundred employees and share of ICT specialists in total employment. Regression analysis is then implemented to study the impact of firm size and digital concentration on firms' mark-ups and productivity.

The authors find that larger size groups have substantial mark-up premia in both digital-intensive and less digital-intensive industries. The gap between the smaller and larger size groups also tends to increase from 2001-2007 to 2008-2014, and across both sectors. Similar results are found for multifactor productivity. Looking at the role of digital technologies, the gaps in mark-ups and MFP are found to increase from 2001-2007 to 2008-2014 more profoundly in the digital-intensive sector.

Hence, the authors conclude that data really is the 'new oil' of the digital economy, where larger firms have greater access to it by virtue of their larger production and customer networks. Furthermore, larger companies are more able to attract and retain the highly specialised skills required to develop these technologies. If the current trends of greater concentration, falling business dynamism, higher mark-ups and greater divergence in productivity continue, there will be threats to competition and ultimately consumer welfare, requiring policymakers to consider appropriate responses.

MARKET CONCENTRATION AND INNOVATION

Akcigit, U., & Ates, S. T. (2019). What happened to US business dynamism? (No. w25756). National Bureau of Economic Research.

Messages	**1. Lower knowledge diffusion is able to explain several trends observed in the US economy, e.g. increasing market concentration, rising markups and declining business dynamism. 2. The role of the secondary patent market in shaping business dynamism is a potential area of examination for policymakers.**

The paper investigates the drivers of the declining business dynamism observed in the US over the last decades, and builds a theoretical model featuring endogenous market power and strategic competition among incumbents and entrants.

The paper builds on 10 empirical regularities for the US economy documented in the economic literature: 1. Market concentration has risen; 2. Increasing average markups; 3. Increasing profit share of GDP; 4. Decreasing labor share; 5. Positive correlation between the rise in market concentration and the fall in labor share; 6. Increasing productivity dispersion of firms, and labor productivity gap between frontier and laggard firms; 7. Declining firms' entry rate. 8. Declining share of young firms in economic activity. 9. Slowing down in job reallocation; and 10. Lower firms' growth dispersion.

Key characteristic of the model is that intense competition among firms induces more aggressive innovation investment and more business dynamism. Yet when the leaders show the extent their technological lead, followers lose their hope of leapfrogging the leader and lower their innovation effort. Likewise, entrants get discouraged when the markets are overwhelmingly dominated by the market leader, and the entry rate decreases.

After calibrating the model to the U.S. economy as if it was in a steady state in 1980, the authors simulate the occurrence of four alternative shocks: corporate taxes, government research and development subsidies, entry costs, and knowledge diffusion. Key finding of the paper is the ability of the knowledge diffusion channel to account for all the considered empirical stylized facts. Specifically, the results suggest that knowledge diffusion accounts for more than 70% of most symptoms of declining business dynamism and at least 50% of the remaining considered trends.

Finally, the paper investigates one of the potential factors determining the decrease in knowledge diffusion in the US: the proliferation of patents among top firms, as well as top firms' increasing share of the secondary patent market, whereby large firms can stifle competition by purchasing patents from smaller firms.

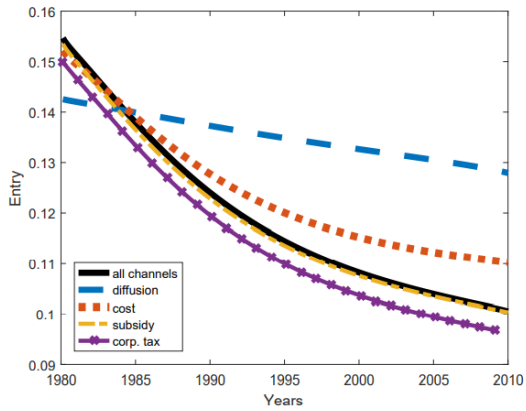


Figure 7: Decomposition of the entry decline

COMPETITION FOR INCLUSIVE GROWTH

Aghion, P., Hasanov, F. and Cherif, R. (2021), Competition, Innovation, and Inclusive Growth, IMF Working Paper No. 2021/080

Messages	**1. Competition and innovation influence inclusive growth through different channels which should be considered by policymakers 2. Competition policies may need to be revamped to address, not only consumer welfare, but also inclusiveness, monopsony powers, and effects on innovation and knowledge diffusion.**

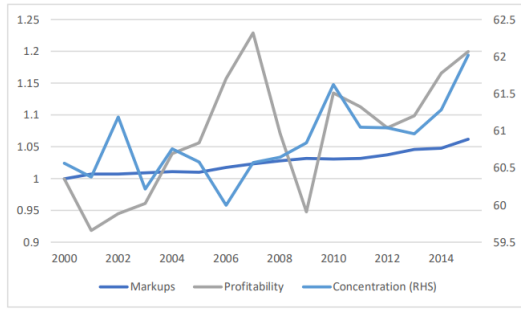
The relation between competition, innovation and inclusive growth is a complex one. In this paper, the authors investigate this relationship based on an overview of the theories and evidence they find in the literature.

They stress how the rise in market power in advanced economies has renewed policymakers' focus on competition policy. While competition and innovation-led growth are critical to drive productivity gains and support broad-based growth, new technologies and trends in market concentration are stifling future innovation and contributing to the marked increase in inequality.

Competition and innovation are related to inclusive growth through different channels that policymakers need to consider. In theory, encouraging more innovation tends to increase top income inequality while improving wages of the workers in productive firms and improving social mobility. In addition, it could also improve business dynamism and reduce market power. Based on their overview, the authors develop two recommendations for a new competition policy to encourage competition and innovation while tackling inequality.

First, they call for a reappraisal of the laws and regulations such that the effect on current and future inequality is explicitly considered. This implies studying the trade-off between consumer welfare in the relevant market, the wider effect on inequality, and the implications of the dominance of a firm in the future on related sectors. It would also mean weighing the effects of policies on transaction costs and future innovation. Moreover, discretion could be given to competition agencies to prioritise sectors and goods affecting poor and middle-class families.

Figure 2. The Rise of Market Power in Selected Advanced Economies and Emerging Markets



Source: IMF 2019b.

Second, in relation to superstar firms, the authors argue that policies to encourage technology diffusion should be considered as part of the competition framework. An alternative policy would encourage the big firms to set-up independent industrial research labs, allowing all firms to access the technologies produced in exchange for a relatively cheap license fee or for free. The associated technology creation and diffusion could help revive business dynamism and in turn mitigate the rise of inequality.

AN INVERTED U OF COMPETITON AND INNOVATION

Griffith, R. and Van Reenen, J. (2021), Product Market Competition, Creative Destruction and Innovation, CEPR Discussion Paper No. DP16763.

Messages	**1. The inverted U relationship between competition and innovation has held up reasonably well over time, although on average the positive effect of competition still seems to dominate empirically. 2. A wise policymaker should seek to reduce artificial barriers that protect dominant firms from reducing the ability of rivals to innovate to catch up or replace the leader.**

One of the longest standing questions in the economic literature is whether product market competition is conducive to innovation and growth, or dampening incentives for research and development.

In this paper, the authors provide an intellectual history of the topic, with a focus on theoretical and empirical development related to the "inverted U" relationship, which illustrates the idea that innovation rises and then eventually falls as the intensity of competition increases.

While there are theoretical arguments that predict both positive and negative effects of competition on innovation, a number of papers provide empirical support for the inverted U. While others show empirical evidence that questions the robustness of the relationship, according to the authors, the inverted U relationship has held up reasonably well.

What does the inverted-U model imply for policy? According to the authors, what it clearly does not imply is that competition policy should be negligent on firms with market power. It does suggest that at high levels of competition it might be important to weigh up potential dynamic efficiency losses versus static efficiency gains from tough anti-trust policy. It might be important to consider the impact of market liberalisation and anti-trust policy on industries that lag behind the technological frontier. Also patent policy is a necessary complement to competition policy, as patents ensure that an innovative firm is rewarded, while competition policies ensure that firms' rents are based on innovation outcomes.

The authors also support the need for institutions and policies that reduce the ability of incumbents to implement strategies such as takeovers of potential future rivals, raising rival costs through reducing compatibility or other business practices and/or lobbying activities to protect market power.

The inverted-U model: Evidence

Figure 1: Empirical Inverted U relationship

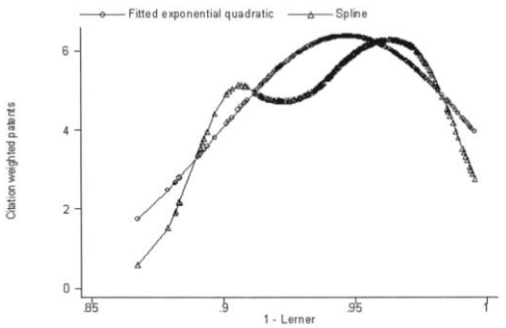


FIGURE II
Innovation and Competition: Exponential Quadratic and the Semiparametric Specifications with Year and Industry Effects

Source: ABBGH (2005)

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