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The Global Rise and Persistence in Surplus Profits: Further Evidence of Increasing Market Power?

Abstract

This paper makes an empirical contribution to recent debates about the causes and consequences of rising market concentration, in which two polar views have surfaced: the "winner-takes- all" approach and the "market power" approach. The former sees rising market concentration as an inherent part of the innovative and productive drive of market economies, with no substantive change in market power whatsoever, whereas the latter views rising market concentration and market power as two simultaneous phenomena feeding off each other, and adversely affecting innovation and overall economic performance. To contribute to differentiate empirically between these two approaches, this paper proposes a new methodology to measure the magnitude of surplus profits, as in both Classical and Marxian traditions, and the persistence of these over time. It then presents global estimations based on firm-level accounting data for 56 developed and developing countries. The paper finds that the share of surplus profits in total profits has increased from an average of 7% in 1995-2000 to 25 % in 2009-2015, and from 24% to 42 % for the 1% most profitable companies. It also reports increasing market concentration and strong profit persistence among top corporations over time.

Key words: Market power, profit persistence, market concentration, competition, corporate finance

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1. Introduction and literature survey

A large number of studies have bared that market concentration have been on the rise over the last decades, notably in the US, but also globally[1]. The question was then raised as to whether this trend escalated from enhanced market power among dominant firms. Market power is a complex concept, which includes a large set of uncompetitive behaviors and strategies at the disposal of firms to increase their profits in a sustainable manner, or in other words, to earn "excess" or "surplus" profits, which will turn, should they persist over time, into economic rents.

Market power is often, at least in a first instance, perceived through the lens of "pricing/monopoly power", which refers to the ability of a company to manipulate the price of an item in the marketplace. This first approach of market power is not as simple as it sounds: it may refer to a myriad of strategies depending on which economic price theories are used as a reference framework. Nevertheless, market power can also grow on "monopsony power", in which firms make surplus profits not so through manipulating the consumer price of their products but rather by squeezing the price of their inputs, including raw materials, services as well as wages. Last, market power can emanate from the exploitation of loopholes in the financial sector, tax and subsidy systems and the like.

The objective of this paper is not to discuss the roots or the boundaries of market power but to measure the magnitude thereof through surplus profits[2]. There has not been so far any attempt, in our knowledge, to gauge and discuss the evolution of surplus profits since the late 1990s, which mark the beginning of the rise in both concentration indices and markups. The paper also aims at bringing evidence supporting the view that the documented rise in market concentration feeds into a general rise in market power.

It first presents an original methodology to assess the magnitude of surplus profits, which takes into account the particularities of data from firms' balance sheets. Secondly, using a database of microdata on publicly listed firms covering 56 developed and developing countries from 1995 to 2015, it provides an estimation of recent trends, at the global level and across all sectors.

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[1] See references in section 1.1

[2] Surplus/abnormal profits are quite a consensual and universal concept in economic theory. The notion is found and defined similarly at both ends of the economic thought spectrum, although the respective paths of reflection leading to the existence and emergence of surplus profits is somewhat different. In classical economics, surplus profits are defined in contrast to "natural" or "normal" profits, which are profits under natural prices. Surplus profits emerge when market prices rise above natural prices. Smith (1776) wrote: "The monopolists, by keeping the market constantly understocked […] sell their commodities much above the natural price, and raise their emoluments, whether they consist in wages or profits, greatly above their natural rate". In the absence of monopoly, surplus profits are temporary, as market prices always tend toward natural prices in a process that Smith described as somewhat similar to gravitational attraction.

K. Marx (1894) highlights, in *Capital, Volume III*, the process of equalization of the general rate of profit through competition (chapter 10). However, he brings out several situations where a firm can secure above-average profits, which he calls surplus profits or extra-surplus value ("*extra-Mehrwert*"). First, surplus profits can arise from technological gaps: technology advanced firms, produce cheaper than their competitors, but sell at market price, thereby making profits above the average. Foreign trade can also yield a higher rate of profits, as firms can sell their products at a higher value in countries with inferior production facilities. Last, K. Marx mentions the case in which a firm has a monopoly on key inputs such as natural resources, technologies, or labour — what actually refers to a situation of monopsony. Just as in the classical perspective, surplus profits should normally have a temporary, sporadic character, because, for instance, as the productive forces develop, technological innovations and inventions expand to many enterprises. Surplus profits decline at one firm and emerge at another, where new, more advanced machines are put into operation.

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1.1 Market concentration indices – recent findings/developments

Market concentration and market power are two closely interlinked concepts, so much so that market concentrations indices have been traditionally used as proxy measures for market power. Market concentration indices track the evolution of corporations' market shares over time. They include for instance concentration ratios or Herfindah-Hirschman indices, commonly released by various statistical agencies, and with which most economists and social scientists are familiar.

The recent rise in market concentration indices was first documented in the US economy, with a paper by Furman and Orszag (2015). The paper analyzed the sales shares of the 50 largest companies in the Census Bureau data and found that about three quarters of the economic sectors saw an increase in concentration between 1997 and 2007.

These preliminary findings were then confirmed by other quantitative studies on the US economy using various sources of data, such as those by Guterriez and Philipon (2017), Autor et al. (2017b), and Grullon et al. (2018). Grullon et al. (2018) calculate Herfindhal-Hirschman indices (HHI) for all US industries between 1972 and 2014 based on the Compustat database. From the late 1990s, the HHI rises steadily until the end of the sample period. Since 1997 the series has surged almost 70%. Another important finding of the study is that the increase in concentration is widespread across industries.

In the Trade and Development Report 2017, UNCTAD (2017) carried out a broader analysis of market concentration at the global level, including non-financial companies in 56 developed and developing countries. The report breaks down the analysis of market concentration by looking at different aspects of company performance, such as revenues, physical assets, other assets and employment. It highlights a sharp increase of concentration through revenues, physical assets and other assets between the late 1990's and the mid-2010's, which suggests that the rise in market concentration is not restricted to the US but affects the world economy.

Another interesting finding is that while market concentration also rose in terms of employment, this increase was much less pronounced, flattening considerably following the dotcom bubble of the early 2000s. This widening gap between indicators of market concentration in terms of revenues and assets, on the one hand, and employment on the other, highlights the wider distributional impacts of market concentration.

Concentration indices are not a flawless measure though. They do include some limitations. They may be biased in the presence of non-competing products within the same classification group. Another important limitation is that they require data on the universe of all competitive firms, which can be challenging especially from a longitudinal perspective.

However, the consistency of the results across studies as well as the magnitude of the revealed increases since the late 1990's are such that there is little doubt that markets have tended to get more concentrated ever since, with the emergence of super champions reaping higher profits. Against this background, the question arises as to why it took so long to acknowledge rising market concentration and to address its potential disruptive effects on competition, even though indicators have been sounding alarms since the late 1990s.

There are first some factors that had a minor influence, such as specific data challenges in the recent era of hyperglobalisation [3] ,which severely undermine the scope of conventional concentration indices. The interpretation of those indices is straightforward in closed economies but becomes more difficult in open ones.

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[3] Hyperglobalisation is characterized by an extensive deregulation of markets – particularly financial and currency ones– in developed and developing countries alike, the attrition of the public realm, and the extension of profit-making opportunities to ever-widening spheres of not only economic, but also social, cultural and political life. The associated withdrawal of public oversight and management of the economy included the curtailment, and sometimes even the elimination, of policy measures previously used by States to manage their integration into the global economy. This was based on the belief that the unregulated forces of supply and demand were best suited to this task.

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The spread of Global Value Chains (GVCs) and the emergence of more sophisticated ownership structures over the last decades has challenged their reliability, by clearly denting the ability to determine firms' real market shares. This is worsened by the blatant lack of appropriate micro-data at the global level. National databases are in general limited in term of geographic coverage whereas currently available international databases exclude smaller firms and/or do not clearly reflect ownerships structures between corporations and their affiliates, subsidiaries or parent companies.

Second, the signals sent by market concentration indices were not taken seriously, in part because of an over-reliance on the theory of "contestable markets" (Baumol, 1982). According to this approach, rising market concentration is not critical as long as incumbent firms with the highest shares are still threatened by potential entrants. It is true that statistics on market concentration per se do not give a full picture of market power: they do not say whether firms are pricing over marginal costs or whether they make excess profits. Yet, there has not been any empirical evidence on the contestable nature of global markets either. It has simply been assumed that the world economy is intrinsically able to ensure that.

A third possible reason is that powerful multinationals have embraced new faces, rendering them less "visible" to conventional antitrust screening and the general public alike, as in they emerged in an environment of fast innovation, where customers perceive an improvement of services as opposed to classic cases of monopolies characterized by poor quality of services and deterioration of customer services. They do not tend to exert their market power by raising consumer prices, which is the red flag for antitrust authorities, but rather by squeezing suppliers' earnings and suppressing employees' wages. In other words, recent times have been ones of monopsony rather than monopoly power.

While rising market concentration is now on its way to be fully acknowledged, opinions still diverge as to whether it has an adverse effect on the economy. There are two mutually exclusive stances.

The first sees in the rise in market concentration a "winner-take-all "story (Traina, 2018; Van Renneen, 2018) with no change in market power whatsoever. In this narrative, markets become more concentrated because of technologies that enable the most productive firms to capture market share from the least productive ones. But unlike dominant firms with heightened market power, "winners" are seen to undergo continual pressure to innovate, invest and keep prices down fearing they be overtaken by a more efficient entrant. The effects of winner-takes-all strategies seem thereby benign, or even positive, resulting in increased competition eventually benefiting the economy through innovation, productivity and efficiency. In other words, signals of rising market concentration are, in this framework, mostly perceived through a Schumpeterian perspective with temporary innovation rents and a virtuous productivity cycle positively affecting the macroeconomy.

Conversely, the second perspective deems the trends in market concentration as resulting from rising market power, reflecting a decline in the competitive nature of markets and the flourishing of rent-seeking behaviours. The monopolistic structure of markets, which may be initially triggered by irreversible gaps in access to technology, thrives as it fuels the market power of dominant firms, which in turn reinforce their position of monopolies by tapping into a series of benefits and privileges not available to regular incumbent firms. By further polarizing income distribution, the rise in market power is held responsible for exacerbating inequality and having adverse effects on growth and the overall well-being.

1.2 Measuring market power: firm-level strategies and alternative approaches

A first approach to market power refers to the ability of firms to charge prices that exceed their marginal cost of production. Under this definition, a firm's market power can be measured through its markup, defined as the ratio of price to marginal cost.

De Loecker and Eeckhout (2017) find that markups of publicly listed firms in the US have largely increased over the last thirty years, reaching an average of 67 % above marginal cost in 2014. They also highlight that

the surge is not induced by any particular industry, such as the IT sector, but rather occurs across industries, and that it mostly results from an increase in the mark-ups of top firms rather than a general increase in the mark-up of all firms. These two results echo the recent patterns in market concentration and are consistent with similar findings by Diez et al. (2018) who estimate mark-ups for 27 countries over the period 2000-2015 along the same methodology.

The recent literature on market power has largely focused on markups[4], but there is a second possible approach to market power, which focuses on the ability of firms to obtain "surplus" profits in a sustainable manner.

While the concepts of natural rate of return and abnormal/surplus profits have been around from the very beginning of modern economic science[5], econometric interest in the incidence and persistence of abnormal profits re-emerged in the contemporary era, mostly from research in industrial organization (Bain, 1956, 1968) and, later, in strategic management (Porter, 1980; Barney, 1991). While Mueller (1986, 1990) pioneered the study of persistence in abnormal profits, the literature has since grown considerably following on from his contributions. Abnormal profits, also known as surplus profits or super-profits refer to profits in excess of a competitive norm. We will mostly employ the term "surplus profits", as "abnormal profits" are conventionally used to point to a gap in terms of return rates in Mueller (1986,1990) and related literature. In addition, while firms and stakeholders are primarily interested in the drivers of persisting abnormal profits as a basis for entrepreneurial success, the degree of persistence in abnormal firm profits can be used by competition authorities, as an index for assessing the need of anti-trust measures in specific sectors.

The paper is divided into four sections. The first section presents the database resulting from the compilation of consolidated financial statements issued by non-financial corporations. Then, we develop the methodology underpinning the calculation of surplus profits and profit persistence in the specific context of accounting data. The third section puts forward the empirical results. The paper ends with a discussion about the implications of the results as to market power.

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[4] See also Gutiérrez and Philippon (2017), Baqaee & Farh (2017), Traina (2018) and Weche & Wambach (2018)
[5] See footnote 3.

2. Data

Data is compiled from consolidated financial statements of publicly listed companies, extracted from Thomson Reuters Worldscope Database. These variables take into consideration a variety of accounting conventions and are designed to facilitate comparisons between companies and industries within and across national boundaries.

Specifically, the database provides annual time-series data from income statements, balance sheets and cash-flow statements over the period 1995-2015. It includes non-financial companies listed in 56 developed, transition, or developing countries[6]. The total size of the database ranges from 5,600 in 1995 to 30,100 in 2015, as a growing number of companies decides to go public, reflecting the global trend of increased use of stock markets for corporate financing. The data was originally extracted in nominal US dollars and then deflated to 2010 US dollars, using the US Consumer Price Index (CPI).

A key indicator used in this study is firms' returns on capital, calculated as the ratio of accounting profits to total assets. Figure 1 shows that the median value of the rate of return to assets (ROA) remains quite stable over the study period, ranging from around 8% to12%. The median ROA is, however, affected by two macroeconomic shocks: the burst of the dot-com bubble in 2000 and the global financial crisis in 2008. While the median ROA recovers quite quickly from the former, the latter seems to have had a more lasting impact. In order to reflect these changes of the median ROA, the results for the evolution of surplus profits are presented for three sub-periods of the overall period of observation: 1995 to 2000, 2001 to 2008 and 2009 to 2015.

In accordance with Mueller (1986), a firm's return on capital is assessed against the average return on capital for all firms in the same sector. Sectors are defined according to the Thomson Reuters Business Classification (TRBC). The latter allows for the comparison of companies through multiple hierarchical levels of industry classification. The retained classification results from regrouping subcategories at the second level ("Business Sector") and comprises 15 sectors[7]. Retailers are classified into "Food and Tobacco" if they sell food-related products and into "Household Goods and Services" otherwise. This way, the resulting classification meets the three following criteria. First, the categories are coherent in categories in terms of nature of activities and implied competition, grouping firms that compete and operate in the same markets. Second, the size of the clusters is large enough to allow for descriptive and inferential statistics. Lastly, the calculation of surplus profits is robust to minor changes in the sectoral classification.

To measure capital held by the firms, we use data referring to total assets in the balance sheet, which are mostly composed of physical assets, including property, plant and equipment (machinery, software, etc.) and other assets, including intangible assets such as patents, copyrights and goodwill in addition to other financial assets. Financial statements do not allow for systematically distinguishing tangible from intangible assets or singling out redundant assets. Total assets therefore remain the most comprehensive variable in the balance sheet to measure the capital employed by firms, despite not necessarily reflecting variations in the nature of the capital.

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[6] Developed Countries: 30

Australia, Austria, Belgium, Bulgaria, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States

Developing and transition countries: 26

Argentina, Bahrain, Brazil, Chile, China, Colombia, Hong Kong (China), India, Indonesia, Jordan, Kuwait, , Lebanon, Malaysia, Mexico, Oman, Philippines, Qatar, Russian Federation, Singapore, South Africa, South Korea, Taiwan (Province of China), Thailand, Turkey, UAE and Vietnam

[7] Including "Automobile", "Chemicals and other materials", "Construction", "Energy and commodities", "Food and Tobacco" (including beverages) , "Hotels, Restaurant and Entertainment", "Household Goods and Services" (goods and services for final consumption, excluding food, beverages, tobacco and textiles), "Industrial Goods and Services" (goods and services for intermediate consumption), "Media and Publishing", "Pharmaceuticals and Healthcare", "Software and IT services", " Technology Equipment", "Textile" (excluding retailers), "Transportation" and "Utilities and Telecom"

Profits, in this paper, refer to firm's operating profits (profits before interest and taxes) as recorded in the cash-flow statement. We opt to use net income from the cash-flow statement rather than from the income statement. In the latter case, comparability across firms and across years may be hampered by the recording of non-cash expenses such as depreciation, amortization and share-based compensation while such costs are not included in the former. Moreover, the use of profits from the cash-flow statement is more consistent with measuring capital by total assets as both take into account changes to current assets and liabilities.

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3. Methodology

Proposition 1:

Let π_{ijt}, π_{ijt}^{T} and C_{ijt}^{I} respectively denote accounting profits, normal (or typical) profits and implicit costs

of firm i in sector j in year t. In the state of normal profits:

$$\pi_{ijt} = \pi_{ijt}^{T} = C_{ijt}^{I} \; (1)$$

The concept of surplus profits used in this study emanates from both Classical and Marxian traditions[8], which address it in very similar ways. In both schools of thought, surplus profits emerge from anticompetitive practices or from uneven access to technology but should wane once anticompetitive behaviours are curtailed and technology gaps closed. Therefore, in the absence of monopoly, profits are inclined to equalize among firms, i.e., the ratio of profits to capital of all firms converge to a specific value, which Smith and Marx respectively call the" natural rate of profit" or the "average ratio of profit".

Economic profit and accounting profit are two distinct concepts. One notable difference is that the former is the net income from all forms of costs while the latter includes explicit costs only. Implicit costs are not reported in firms' balance sheets and comprise all forms of opportunity costs, such as those of using physical capital, e.g., land, building, machinery, and the like, for productive activities instead of leasing it. In the absence of monopoly, we mentioned above that both Classical and Marxian traditions stipulate that profits should gravitate toward a specific value, which we call "normal profits". These should be roughly equal to the minimum amount required for a company to subsist and remain competitive, or in other words, to all the opportunity costs that it faces. From an accounting perspective, this translates into normal profits amounting to implicit costs, and therefore leads to Proposition 1.

Proposition 2:

In the state of normal profits, $\exists \, A_t > 0$ and $0 < \alpha_t \leq 1$ such that:

$$\frac{\pi_{ijt}^{T}}{K_{ijt}^{\alpha_{jt}}} = A_{jt} \; (2)$$

With K_{ijt} denoting the capital employed by firm i in sector j in year t.

By definition, implicit costs increase with the capital employed by the firm, K_{ijt}. All firms in year t and sector j, are assumed to be subject to the same function linking implicit costs with capital. Therefore, with the same notations as in Proposition 1 and 2:

$$\exists \; F_{jt} \text{ such that } C_{ijt}^{I} = F_{jt}(K_{ijt}) \text{ and } F_{jt}' > 0 \; (3)$$

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[8] The definition of surplus profits used in this section refers to the concepts found in footnote 3 of the "Introduction and literature survey" section.

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Different assumptions can be made regarding the form of F_{jt}. If most of the implicit costs are due to opportunity costs for not leasing property or plants then it is likely that F_{jt} is linear, that is $C_{ijt}^I = A_{jt} K_{ijt}$, where $A_{jt} > 0$. In a competitive environment, F_{jt} may also display diminishing returns. Increasing returns would be, in contrast, an indicator of imperfect competition. In the general case, F_{jt} has the following form:

$$F_{jt}(K_{ijt}) = A_{jt} K_{ijt}{}^{\alpha_{jt}}, \text{ where } A_{jt} > 0 \text{ and } 0 < \alpha_{jt} \leq 1 \quad (4)$$

Proposition 2 stems from the combination of equations (1), (3) and (4). Overall, it indicates that, in the absence of a monopoly, all firms in a sector share the same accounting rate of return A_{jt}, thus reflecting the concept of normal rate of return pointed out by Smith and Marx.

The conditions on α_{jt} come from the properties of the second derivative and can be tested empirically, by estimating the following econometric equation:

$$\ln \pi_{ijt} = \alpha_{jt} \ln K_{ijt} + \ln A_{jt} + \varepsilon_{ijt} \quad (5)$$

Where ε_{ijt} is an error term with zero mean and constant variance. Equation (5) is estimated through various mixed linear models with a maximum likelihood procedure (Bates, 2015).

Proposition 3:

$$\widehat{\alpha_{jt}} = \widehat{\alpha_j} \text{ and } \widehat{A_{jt}} = median \left\{ \frac{\pi_{ijt}}{K_{ijt}{}^{\widehat{\alpha_j}}}; \ i \in sector\ j \right\} \quad (6)$$

As aforementioned, it is reasonable to presume that implicit costs resulting from for not leasing property, plants or equipment dominate over other forms of opportunity costs, the share of which remain relatively small. As a result, we may assume that α_{jt} does not vary with time. This assumption is validated in the econometric findings of the subsequent section.

A_{jt} then strictly represents the normal accounting rate of return in the situation of normal profits. The likelihood that a given firm reaches this rate grows with the intensity of competition and the number of rival companies in the market. This suggests that the accounting rate of return converges in probability to A_{jt} with the number of operating firms in the market.

$$\lim_{N_j \to \infty} P\left(\left| \frac{\pi_{ijt}}{K_{ijt}} - A_{jt} \right| \geq \epsilon \right) = 0, \text{ for all } \epsilon > 0 \quad (7)$$

And where N_j is the number of firms in sector j.

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In theory, the distribution of return on assets follows a Gaussian distribution. Intuitively, A_{jt} should coincide with the peak of the distribution that invariantly corresponds to the mean, the mode or the median. However, it is well known that the empirical distributions of rate of returns are leptokurtic, or in other words have fat tails. The data employed in this paper is by no means an exception. As the median is a robust measure of central tendency, it proves to be a better estimator of A_{jt} than the empirical mean under these distributional characteristics. In this approach, we opt to use the median of the return on assets.

Following the above mentioned, normal —or typical—profits, π_{ijt}^T for firm i in year t and sector j, can be respectively estimated as:

$$\widehat{\pi_{ijt}^T} = K_{ijt}{}^{\widehat{\alpha_j}}\widehat{A_{jt}} \quad (8)$$

Surplus profits π_{ijt}^S are defined as the difference between observed total profits and typical profits. Therefore, for firm i in year t, surplus profits are given by:

$$\widehat{\pi_{ijt}^S} = \pi_{ijt} - \widehat{\pi_{ijt}^T} \quad (9)$$

The share of surplus profits S over a time span $[t_1; t_2]$ is then calculated as follows:

$$S = \sum S_j$$

$$\text{with } S_j = \sum_{t=t_1}^{t_2} \sum_{i=1}^{N} \widehat{\pi_{ijt}^S} \Big/ \sum_{t=t_1}^{t_2} \sum_{i=1}^{N} \pi_{ijt} \quad (10)$$

Propositions 2 and 3 demonstrate a main assumption in the work of Mueller (1986) in regard to the relation of a firm's return on capital with the average profit rate for all firms. This relation is the starting point of Mueller's analysis and is presented intuitively as a hypothesis in the modelling section of his paper, but without detailed evidence. In fact, while he also deals with accounting profit rates, he overlooks the potential effect of the concavity of implicit costs. More specifically, he assumes that a firm's returns on capital at any point in time are proportional to the mean — or similarly the median— profit rate in the economy. He assumes that a firm's returns on assets consist of three components: the competitive return on capital common to all firms; a long-run permanent rent peculiar to the firm itself; and a short-run quasi rent, which is also idiosyncratic to the firm but varies over time and converges on zero in the long run.

Mueller (1986, 1990) provides a standard econometric approach for profit persistence, based on an autoregressive model:

$$\Pi_{it} = \alpha_i + \lambda_i \Pi_{it-1} + \varepsilon_{it} \quad (11)$$

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Where he refers to "abnormal profits", Π_{it}, as the difference between firm i 's return on capital and the mean —here the median—return on capital for all firms, and ε_{ijt} is an error term with zero mean and constant variance[9].

Equation (11) provides two persistence indicators at the firm level. On the one hand, $\widehat{\lambda_\iota}$, which in the literature is often referred to as short-run persistence, is a proxy for the speed at which the forces of competition drive abnormal profits to the long-run value of the autoregressive process. On the other hand, $\widehat{\rho_\iota} = \widehat{\alpha_\iota}/(1 - \widehat{\lambda_\iota})$ is the long-term value on which, according to the model, a firm's time series of abnormal profits is converging. This long-term persistence indicator can be interpreted as a measure of permanent rents that are not eroded by the competitive process. Assessing firms' competitive position and their level of profit persistence requires to take into consideration these two persistence measures.

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[9] The order of the autoregressive process can also be estimated based on the Schwarz Bayesian information Criterion (see for instance Gschwandtner (2005)). While it adds more complexity in the estimation, it does not change significantly here the estimation of the aggregated short-run and long-run measures of profit persistence.

4. Results

The estimation of surplus profits first requires the calculation of the implicit cost elasticity of capital, in accordance with the specification described in equation (5). We therefore estimate (8) by using Maximum Likelihood Estimation —MLE. $b = (\alpha_{jt}, \ln A_{jt})$ and $y = (\ln \pi_{ijt}/b)$ can be viewed as the realizations of two random variables, respectively unobserved and observed. To meet the requirements for this model, b and y are assumed to be normally distributed, as suggested by their empirical distributions.

Figure 1 is a conventionally used chart in the framework of mixed-effect models (Bates, 2015), representing the distributions of the annual elasticities by sector (α_{jt}). It reflects that, in most sectors, implicit costs elasticities follow a Gaussian distribution of mean 1. However, in some sectors such as "Construction", "Hotels, Restaurant and Entertainment" and "Transportation" elasticities seem to range in average below the unit value in average implying diminishing returns, as discussed in the previous section. Conversely, in few other sectors, mostly "Energy and commodities" and "Food and Tobacco", elasticities tend to range above the unit value, revealing increasing returns, probably stemming from a higher level of fixed costs and/or a higher intensity in "exclusive assets". In the light of these preliminary findings the question arises as to what econometric specification is the best to take into account the role of implicit costs in the evaluation of surplus profits. To that end, we propose to test alternative approaches, which refer to nested models of (5), as follows:

$$\ln \pi_{ijt} = \alpha_j \ln K_{ijt} + \ln A_{jt} + \varepsilon_{ijt} \quad (11)$$

$$\ln \pi_{ijt} = \alpha \ln K_{ijt} + \ln A_{jt} + \varepsilon_{ijt} \quad (12)$$

(11) implies that the implicit cost elasticity of capital is sector-specific but time-invariant, whereas (12) considers a fixed-effect for capital across sectors and years. We, therefore, test model (6) against model (11), and then model (11) against model (12), as shown in Table 1, using AIC and BIC[10] criteria as well as an analysis of variance (Bates, 2015). First, we observe that model (11) is the best in terms of AIC and BIC. Second, the p-value of the first ANOVA (analysis of variance) test is very high (close to 1) while the one of the second test is below 1%, implying that (5) and (12) should be rejected in favor of (13).

Under this specification, Figure 3a shows that the surplus share of profits increased substantially from an average of 4% in 1995-2000 to 16% in 2001-2008 and 21% in 2009-2015. 2001-2008 is hence a period of fast growth in the surplus share of profits while 2009-2015 corresponds to an episode of slower relative growth, suggesting that the global financial crisis may have diminished the ability of firms to generate surplus profits. Figure 3b, by way of comparison, provides the evolution of the share of surplus profits following the econometric specification (12). While the general level of the surplus share of profits is higher, the magnitude of the increase between 1995 and 2015 is very similar.

Yet, this indicator, which is a synthetic aggregate of all firms, does not capture the notable and widening disparities between firms at the top of the distribution with continuously increasing surplus profits, and firms at the bottom with declining ones, even more drastically in the aftermath of the 2008 financial crisis. In 2009-2015, surplus profits represented 45 % and 49 % respectively of recorded operating profits of the most profitable 10% and 1% companies, representing a rise by around 6 percent points from 1995-2000 (figure 3a). In the context of the decline of the labour share (Karabarbounis and Neiman, 2013; Barkai, 2016), the rise in surplus profits among top firms would appear even steeper and more blatant, should it be checked against total value-added rather than total profits.

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[10] Akaike Information Criterion and Bayesian Information Criterion

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Table 2 provides insights about the persistence of abnormal profits. The average long-term persistence value of top 1% reached 0.12 in 2009-2015, which means that these firms are estimated to earn long-run profits around 8 percentage points above the competitive norm. Moreover, the long-term estimate increased by three percent points from 1995-2000, revealing the strengthening of their position. The short-run value is high too: in 2009-2015, 46% of surplus profits initially generated remain one year later rand 21% two years later. In view of these results, surplus profits generated by top 1% firms can be considered, by and large, persistent and conducive to economic rents.

While the same conclusion can be drawn overall for the top 10% of firms, the picture is different for those at the bottom of the distribution, for which profits appear much less persistent. The long-term value reveals that they earn profits 15 percentage points below the competitive norm in the long run[11], down 7 points from 1995-2000. Likewise, the short-term persistence has been halved since 1995-2000: only 22% of surplus profits initially received remain one year later in the last observed time period and are almost eroded three years later. Firms at the bottom of the distribution hence experienced a pronounced decline in profit persistence between 1995 and 2015.

Figure 4 shows that, in the meantime, market concentration rose substantially, to the benefit of the top 1% of companies. Over the time period of the study, they have strengthened their market dominance across different performance criteria, such as revenues, physical assets, other assets and to a lesser extent and pace, employment. Their share in revenues has doubled since 1995-2000, reaching 24% in 2009-2015. Likewise, the share in physical assets and other assets has continuously increased from 10% and 9% respectively to 23% and 22%. Beyond organic corporate growth, the high pace of market concentration has also been driven by Mergers and Acquisitions (M&As): in 2009-2015, top 1% firms have owned 29% of net assets from M&As, while 18% in 1995-2000.

In contrast, while market concentration also rose in terms of employment, this increase was much less pronounced, flattening considerably from the 2000s. Top firms have not created as many jobs as they have amassed revenues and assets. The widening gap between indicators of market concentration in terms of revenues and assets, on the one hand, and employment, on the other hand, supports the view that asymmetric market power is a strong contributory factor to rising income inequality.

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[11] It should be noted that a firm with negative abnormal profits, even when persisting in the long-term, is not necessarily forced out of the market since the competitive norm can settle above 0.

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5. Discussion and conclusion

Since the early 1980's, a number of economists and antitrust authorities have been hesitant to examine market power using firm level balance sheets. The seminal articles by Fisher and McGowan (Fisher and MacGowan 1983, Fisher 1984), in which they claim that "… there is no way in which one can look at accounting rates of return and infer anything about relative economic profitability or, a fortiori, about the presence or absence of monopoly profits"[12], shaped the narrative underlying this stance. These findings have often been employed well beyond their scope of validity to disqualify any attempt to approach market power quantitatively, leaving a notable analytical lacuna, contrasting starkly with the increasing availability and quality of accounting data. Yet, the limitations of their research were immediately identified, including by Long and Ravenscraft (1984) as well as Kay and Mayer (1986), who highlighted that, although individual accounting profit numbers could under certain circumstances deviate significantly from economic profits, there was no evidence that large deviations would exist on average. Hence, it stands to reason that sustained high accounting rates of return indicate persistently high economic rates of return.

By developing an empirical measure which capitalizes on the profitability dimensions of market concentration, this paper shows that firms' accounting data remains relevant for the assessment of market power, especially from a macroeconomic perspective. The methodology developed for this purpose is built upon the specific features of firm-level accounting data. This involves accounting profits and accounting rates of return for what they are, and not as respective substitutes for economic profits and economic rates of return. The introduction of the accounting rate of return naturally derives from the relation between accounting profits and the implicit costs function. Furthermore, market power is not assessed unilaterally: firms are compared with one and other. Market power is not inferred when accounting-based indicators remain within the bounds of what is regularly observed, even if they are inherently high.

Under this novel methodological framework, this paper finds that the share of surplus profits in total profits, at the global level, has increased from an average of 4% in 1995-2000 to 21% in 2009-2015. The rise is mostly driven by top corporations. The magnitude of surplus profits, growing in tandem with rising markups (De Loecker and Eeckhout, 2017) and increasing market concentration, suggests that these companies have reinforced their market power.

Our findings are also consistent with two global macroeconomic trends, namely the decline in the labour share and the decrease in the investment rate.

Karabarbounis and Neiman (2013) show that the global labor share has been declining since the late seventies, with a marked acceleration since the late nineties. They estimate an overall drop by 5 percentage points. As market power increases, so does the capital share of income, for mostly two reasons. The first is that firms with power in their product market can charge prices above marginal costs and, thus, earn excess profits, which would accrue to shareholders. The second is that firms with pricing power in a given input market can pay less for that input than it will contribute to marginal revenue. In both cases, a greater share of a firm's income would flow to shareholders overall.

In the meantime, global investment has remained sluggish despite falling borrowing costs and rising expected returns, as measured by Tobin's Q, the ratio of the market value of firms to the book value of their capital stock (International Monetary Fund, 2019). In other words, capital growth has slowed down over the past two decades while the rise in the Tobin's Q, which is the standard measure for investment opportunities, suggests that capital accumulation should have remained robust. These recent trends fit the "market power" narrative but contradict "The winner takes all" theory. In the former case, dominant firms are understood to exploit their power by holding back production, implying that they have less incentive to invest. Firms in markets with weakening competition also do not spend as much on research and development as their survival is less likely to depend on continuous innovation in the product markets. Conversely, the heightened competition stemming

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[12] See p.90 in Fisher and Mac Gowan (1983)

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from a winner-take-all environment should boost investment because even the most productive firms need to maintain their position against rivals and prospective entrants.

The combination of record high corporate profits, stagnant or falling investment rates in the real economy and heightened income inequalities has triggered a growing policy debate around the need to tighten up US and EU antitrust legislation and enforcement, where the majority of corporate headquarters reside. There is an emerging consensus among legal and economic scholars that more rigorous merger enforcement is needed. Antitrust authorities are also invited to examine today's largest firms more closely, notably in the IT sector, and identify, specific conducts that harm customers or undermine competition in a more efficient way.

While some consider that the tightening can be implemented under the existing antitrust framework (Shapiro 2018, Melamed and Petit 2019), others voice concern over the hegemony of the consumer welfare standard, which has prevailed since the late 1970s (Kovacic 2007), in the aftermath of the great success of Robert Bork's book The Antitrust Paradox (1978). Critics highlight the obsolescence of the current system and advocate an overhaul of it, in view of the development of the digital economy, characterized by winner-takes-all competition, multi-sided platforms and network effects (Katz and Sallet 2018), utilization of big data (Newman 2014; Rubinfeld and Gal 2016) and the provision of services for a zero-nominal price (Newman 2015). More recent studies go further and argue that the ardent efforts to confine antitrust to solely presumed customer-oriented considerations promoted economic policies that actually neither improved consumer welfare nor fostered competition (Steinbaum and Stucke 2018; Wu 2018), and that consumer welfare antitrust is a political choice that disregards important manifestations of corporate power and thereby tolerates the monopolistic and oligopolistic domination of markets and society (Khan and Vaheesan, 2017; Vaheesan 2018).

An important line of argumentation of the supporters of the consumer welfare standard is that observed increases in industry concentration do not imply a rise in monopoly or oligopoly power. This paper makes a contribution to this growing debate. By considering profits, it provides further and different quantitative evidence that such a rise has indeed taken place over the past years. Revising antitrust policies on its own cannot be expected to curb rising income inequality and induce more inclusive growth. A coordinated approach incorporating the appropriate tax and employment policies is required. However, in an environment where rising inequality took the shape of concomitant declining labour share and increasing market power, it becomes clear that antitrust policies have a greater role to play in fostering a fairer and more inclusive world economy.

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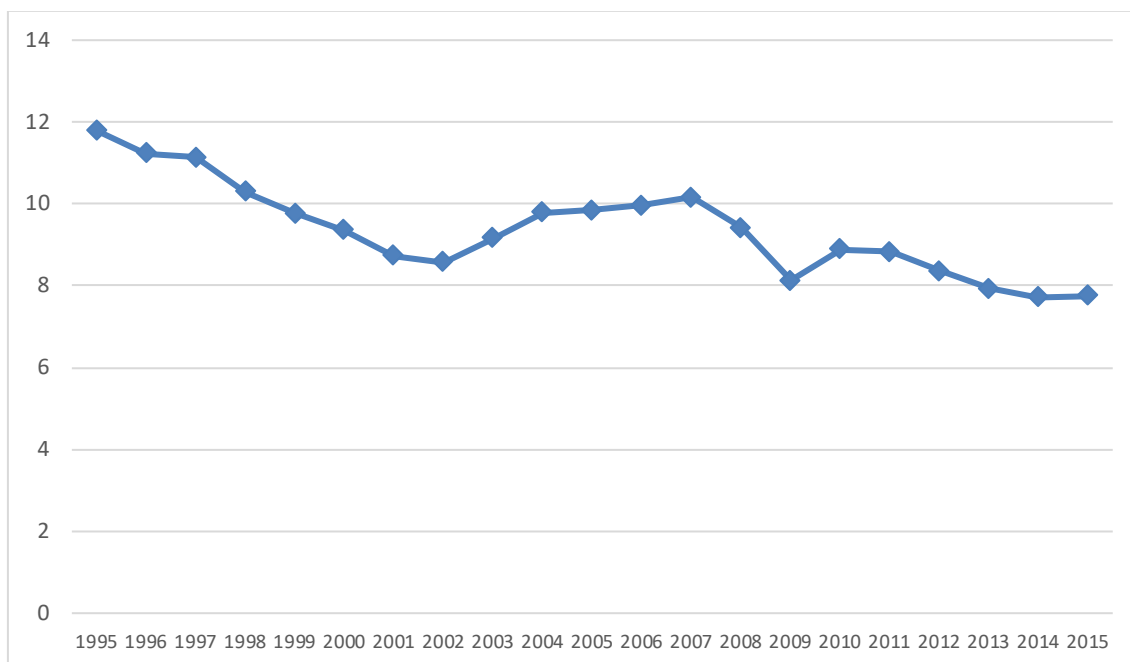
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7. Figures

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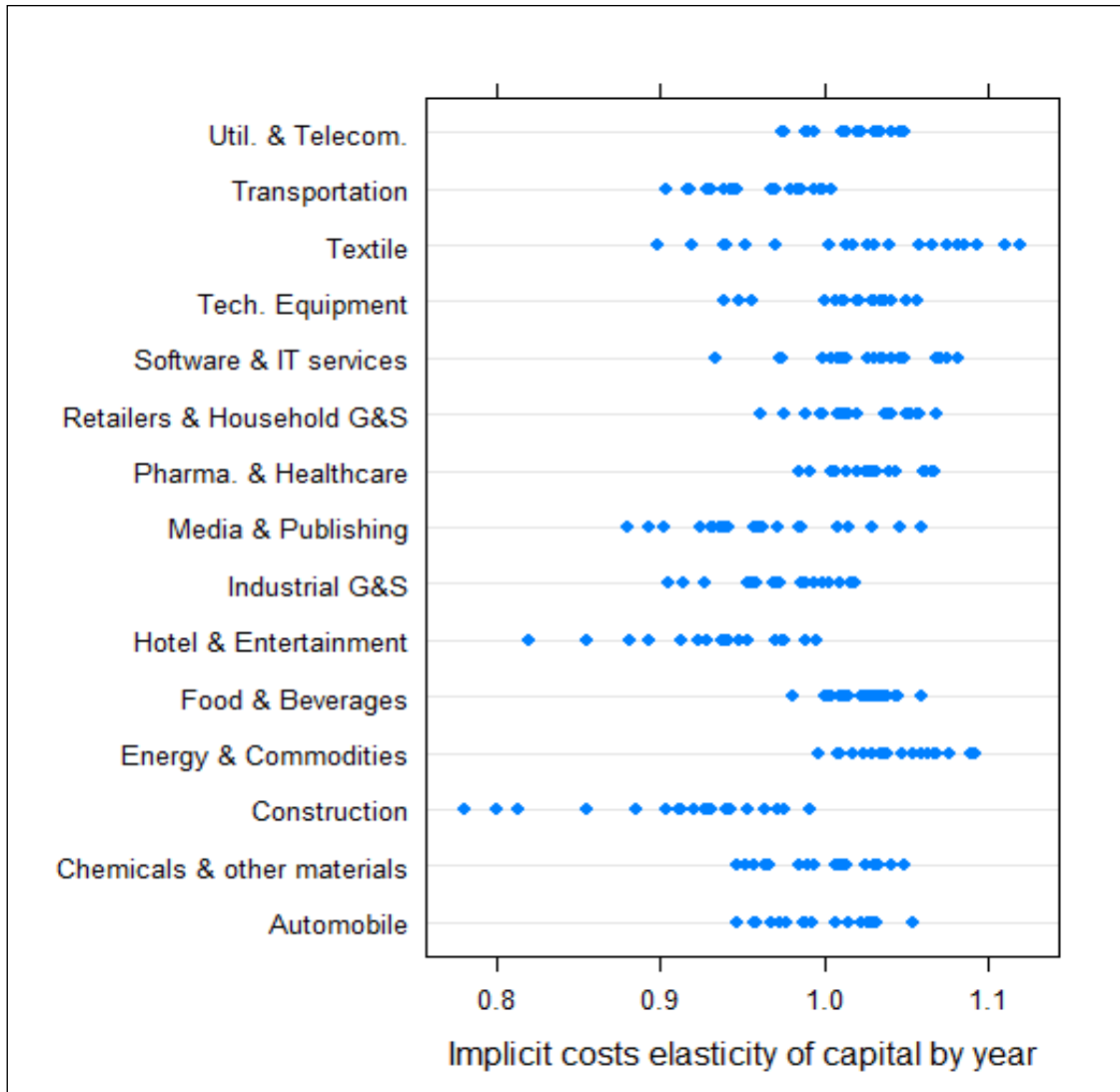**Figure 3a. Evolution of the share (%) of surplus profits (1995-2015) – under econometric   specification (11)**

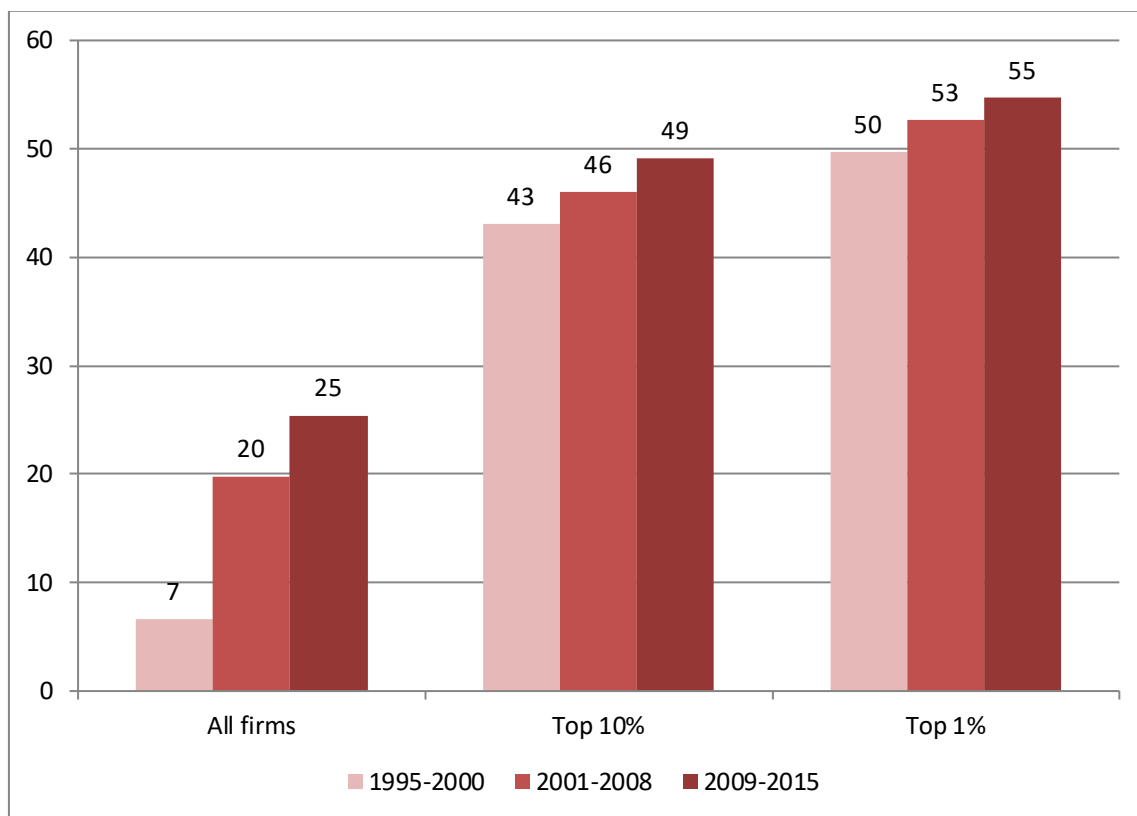**Figure 3b: Evolution of the share (%) of surplus profits (1995-2015) – under econometric specification (12)**
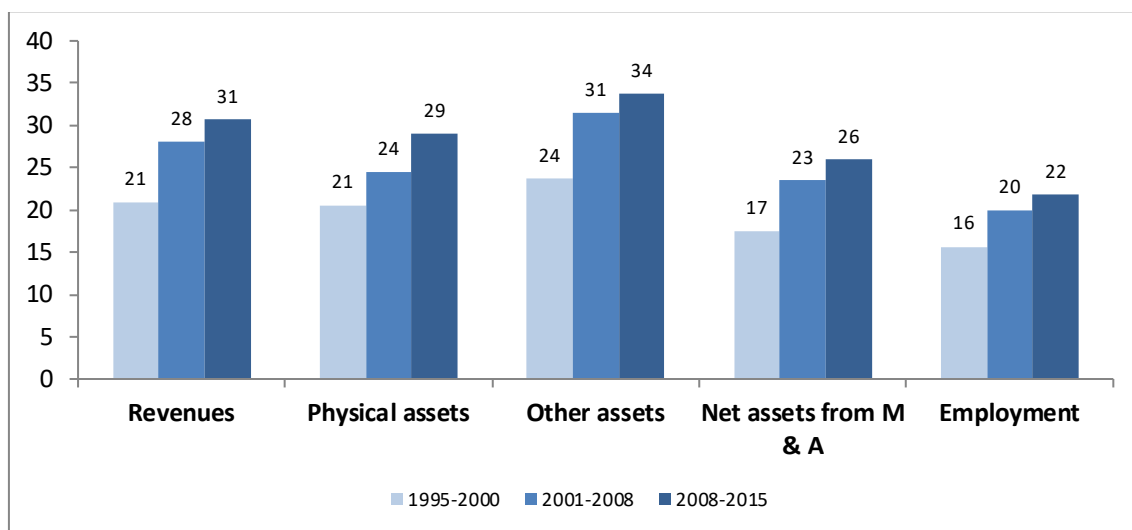
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Figure 4: Shares in revenues, physical assets, other assets, net assets from M &A, and employment of top 1% firms (1995-2015)

8. Tables

Table 1: Comparison of various nested models for the estimation of the implicit cost elasticity of capital

	Model (5) with α_{jt}	Model (11) with α_j	Model (12) with α
Degrees of freedom	4	3	3
AIC	463438	462609	463319
BIC	463478	462640	463349
LogLik	-231715	-231302	-231656
Deviance	463430	462604	463313
P-value of Chi-squared test H0: (6) better than (5)		0.98	
P-value of Chi-squared test H0: (7) better than (6)		<0.001	

Table 2: Average short-term and long-term persistence — respectively in percent and percentage points — of abnormal profits by time period and group of firms

Firms	1995-2000		2001-2008		2009-2015	
	$\hat{\lambda}$	$\hat{\rho}$	$\hat{\lambda}$	$\hat{\rho}$	$\hat{\lambda}$	$\hat{\rho}$
Top 1%	49	9	47	11	46	12
Top 10%	50	7	47	5	42	6
Others	40	-8	34	-10	22	-15