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## Cross-ownership by institutional investors: Effects on competition in Europe

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#### **Chapter 1: Introduction**

Cross-ownership is the phenomenon according to which one investor holds an ownership stake (a non-negligible percentage, either a minority or a controlling stake) in more than one firm within the same industry at a certain point in time, as recognizable in Seldeslachts et al. (2017). These horizontal holdings may be the result of active or passive investment strategies and they are of particular interest in the context of institutional investors (such as mutual funds, hedge funds and investment funds), whose presence in the ownership structure of listed companies has gradually become more and more relevant over the last decades in Europe, as will be recognized from our analysis, as well as in the US, as highlighted by He and Huang (2017).

The key rationale behind studies on cross-ownership lies in the analysis of its effects on the competitive landscape of a company within its industry (and a crucial element is that to precisely define the perimeter of a product industry), as done by Azar et al. (2018), Kennedy et al. (2018), Dennis et al. (2018), Azar et al. (2016), Gramlich and Grundl (2017), Gerakos and Xie (2018), Newham et al. (2018), Clapp and Torshizi (2019), Clapp (2019) and Backus et al. (2018). In a profit-maximising world, where managers' actions are aimed at magnifying their own shareholders' interests, if the shareholders appearing within the ownership structure do not hold any other stake in companies within the same product market, then the maximization of shareholders' profits perfectly coincides with the maximization of the company's profits. If, instead, ownership structures of rival firms are intermingled, managers would have to consider shareholders' broad interests in order to decide on corporate strategy, thus taking into consideration also their own shareholders' ownership stakes in rival firms and potentially deviating from the managed firm's best interests, as theoretically set out by Bresnahan and Salop (1986), Reynolds and Snapp (1986), Salop and O' Brien (2000).

Overall, the result may be a lessened competition consisting either of unilateral effects (product price increases introduced by one market participant only) or coordinated effects (one firm acting as a "cartel ringmaster" and constraining either production or prices for the whole market), as summarized by Seldeslachts et al. (2017). The way in which shareholders' interests shape a company's policies towards anticompetitive outcomes can consist of direct influence (vote), voice, informal meetings, compensation packages for managers.

Furthermore, the phenomenon of cross-ownership may be also interpreted as a trigger for coordination among cross-held companies as in He and Huang (2017), facilitating explicit forms of product market collaboration (via a reduction of informational asymmetry) and fostering innovation productivity as well as operating profitability.

The measures traditionally employed in order to grasp cross-ownership from a quantitative point of view are industry-concentration measures such as the Herfindahl Hirshman Index (HHI) and the Modified Herfindahl Hirshman Index (MHHI), which are also utilized by regulatory agencies in order to decide on the feasibility of mergers and acquisitions for the purpose of avoiding monopolistic or oligopolistic outcomes, as reported by Patel (2018). In the academic arena, these measures have been employed to study cross-ownership anticompetitive effects within specifically defined industries, as done by Azar et al. (2018) for the airline industry or by Gerakos and Xie (2018) for the pharmaceutical industry. In order for these measures to be computed and effectively utilized for inference purposes, one needs to have access to a wide dataset on the prices

of the products or services offered by all the companies in an industry (for instance one needs the airline ticket prices for all the available routes in a specific region), so that to evaluate whether larger cross-ownership percentages correspond to price increases.

However, the purpose of our study is to empirically examine the implications of institutional cross-ownership of same-industry companies on product market performance for each and every possible industry rather than for pre-selected and isolated markets. Consequently, we decide not to use typical market-concentration measures such as HHI and MHHI but to adopt the five cross-ownership measures computed by He and Huang (2017). In contrast to this last paper, which will represent the main reference for our analysis, we focus our study on the European stock market rather than the US one, which is an exercise that, to the best of our knowledge, has not been carried out yet. This will enable us to compare the effects of cross-ownership in markets marked by traditionally dispersed ownership structures (as in the US) and in markets historically characterized by more concentrated ownership structures (as in Europe, even though different European countries are marked by different features).

In this way, we will be able first to develop a thorough picture on the extent to which cross-ownership is a European phenomenon, its evolution over time and its distribution across industries. More importantly, we will be in the right conditions to understand whether cross-ownership changes are associated to changes in product market performance and operating profitability. In that sense, He and Huang (2017) find that cross-ownership is associated with an improvement in terms of collaboration among horizontally held companies in the US, which translates into higher market share growth with respect to non-cross-held firms. We will move towards the same hypothesis and

evaluate the effects of cross-ownership both on market share growth and operating profit margins.

The ultimate scope of every analysis on cross-ownership is to ascertain whether its potential downsides require to intervene with an ad hoc set of regulations or by adapting existing bodies of rules. Hence, we devote part of our analysis to reconstruct the existing legislative framework on cross-ownership both in the US and in Europe, as well as to depict regulatory proposals made by academicians and regulators who recognize the need to introduce new rules to prevent cross-ownership to trigger anticompetitive issues. The empirical analysis will then be useful in order to understand whether there is a univocal need to face the phenomenon in regulatory terms and whether some rules are more suitable than others to tackle competitive harms.

From our empirical analysis, it may be recognized that, over the sample period (2001-2018), institutional cross-ownership in Europe has gone through a gradual yet remarkable increase and summary statistics for cross-held companies are similar to those found for U.S. listed companies in the reference paper. However, once we set up a detailed comparison among cross-held and non-cross-held companies, we do recognize some statistically significant differences in terms of control variables but not in terms of product market share growth or operating profitability. The absence of a statistically relevant relationship between cross-ownership measures and market share evolution as well as between cross-ownership measures and operating profit margins is confirmed by means of multiple panel regression models and several robustness checks. This suggests that, despite the substantially similar statistics in Europe vis a vis the U.S. as far as cross-ownership measures are concerned, in Europe these horizontal holdings are not

univocally associated neither to an improved coordination among cross-held companies nor to an anticompetitive outcome, thus suggesting that a generalized regulatory intervention to limit cross-ownership in Europe is not needed.

Our study makes three key contributions to existing literature. First, to the best of our knowledge, it is the first research to analyse coordination and competition effects stemming from cross-ownership in Europe for each and every industry rather than for isolated niche markets. Second, given its methodological structure similar to He and Huang (2017), it allows to make a thorough comparison between Europe and the U.S. in terms of the dimension of the cross-ownership phenomenon and to assess whether the effects of cross-ownership on competition are the same as well as if there is an actual need for a unique regulatory intervention in both the geographical areas. Third, our analysis is the first to explicitly compare institutional cross-ownership to cross-ownership by institutional and non-institutional investors together, thus allowing to understand the extent to which the two phenomena are substantially similar or different.

# Chapter 2: Definitions of cross-ownership and economic theory of its effects on competition

#### 2.1. Institutional investors and investment strategies

Celik and Isaksoon (2014) state that, though there is no simple definition of institutional investors, the closest common feature among all of them is that they are not physical persons but rather they are organized as legal entities and tend to operate as intermediary investors, meaning they manage and invest other persons' wealth1 on a systematic basis. Three sub-categories can be specifically identified: traditional institutional investors (pension funds, investment funds, insurance companies), alternative institutional investors (hedge funds, private equity funds, exchange-traded funds, sovereign wealth funds) and asset managers investing in their clients' name. Other entities not included in the previous list could be closed-end investment companies, proprietary trading desks of investment banks, foundations and endowments. All these institutions are also highly intermingled in practice, as one institutional investor may invest in financial instruments offered by other institutional investors.

Institutional investors' investment strategies can be schematized according to 4 alternatives, which imply different business models. The first is passive-index: it is the commitment to hold a portfolio mimicking a predefined index of shares (thus, adjustments to the composition are not the result of an active choice, but rather the automatic consequence of fluctuations in the index weights). The objective of such a strategy is that of delivering the return of a market index with reasonable turnover,

<sup>&</sup>lt;sup>1</sup> There are some exceptions. For instance, sovereign wealth funds can be recognized as ultimate owners when they operate as financial stabilisation funds or when they serve as *de facto* state ownership agencies.

diversified portfolio and minimal administrative and operating expenses. The second alternative is passive-fundamental: investors initially make a choice by selecting the individual companies in which to invest and then keep them for an extended period of time (examples are strategic national investments by a sovereign wealth fund or core investments of a closed-end investment company as well as sector indices). The third strategy is active-fundamental: an investor relies on continuously purchasing and selling stocks in companies that are chosen on the basis of fundamental analysis (this is often associated with a high degree of, at least temporary, ownership engagement – shareholder activism – to bring about changes in the way the company is managed. The last alternative is active-quantitative: it is based on the large inflow of information processed by sophisticated software and used in the form of high frequency trading that has short time frames for transactions and provides no incentives for ownership engagement.

#### 2.2. Shift from active to passive investment strategies

Since 2008, there has been a massive shift worldwide from active investment management to the passive index fund industry, largely dominated by the "big 3" (BlackRock, Vanguard, State Street). The main reason behind such switch is that in the boom times before the Great Financial Crisis most investors tolerated high fees, hoping that mutual fund and hedge fund managers would deliver superior returns thank to their active trading strategies. However, it has become increasingly clear in recent years that the majority of both actively managed mutual funds and hedge funds are not able to consistently generate higher returns than established benchmark indices, such as the S&P 500. As such, there has gradually been a concentration of listed companies' corporate ownership in the hands of few institutional investors, which clearly poses competitive threats in case of companies operating within the same industry. Besides, Fichtner et al.

(2017) highlight that the combination of concentrated ownership with passive investment strategies leads to contested consequences. On the one hand, passive investors do not have strong incentives to be concerned with company-level performance as they simply aim at replicating the composition of an index. On the other hand, the consolidation of passive investment strategies may entail a re-concentration of corporate control, since passive institutional investors can theoretically exercise the voting power of the shares held by their funds. To that end, some indications can be found that the "big 3" are, to some extent (or at least in the public debate), interested in exerting influence on the companies in which they hold ownership stakes. For instance, William McNabb III, Chairman and CEO of Vanguard, claimed: "In the past, some have mistakenly assumed that our predominantly passive management style suggests a passive attitude towards corporate governance. Nothing could be further from the truth"2.

#### 2.3. Common ownership and cross-ownership: a definition

Common ownership, despite being fairly difficult to define, is the most widely used label to identify the phenomenon according to which, under general terms, firms competing in a precisely identified industry are owned (to a smaller or larger extent) by the same individual investor or a small group of investors (Seldeslachts et al., 2017). Though superficially straightforward, such definition does not encounter univocal agreement among academics. First of all, the expression "cross-ownership" is used often as a substitute for common ownership, as recognizable in Trivieri (2005), where it is defined as the situation in which shares are held, either directly or indirectly, by the same subjects in more groups. This last characterisation allows us to grasp a fundamental distinction:

<sup>&</sup>lt;sup>2</sup> Grind K., Lublin J. S., "Vanguard and BlackRock Plan to Get More Assertive With Their Investments", The Wall Street Journal, 4th March 2015.

something is to consider cases in which rival organizations have direct ownership interests in each other (examples are when there are one-sided minority shareholdings by one firm of another or reciprocal minority shareholdings between two firms), which is known as "cross-holding", "partial ownership" or "structural links" (OECD, 2017); something else is when competing companies have one or several shareholders in common, a situation alternatively referred to as "institutional cross-holding"3, "institutional ownership", "overlapping ownership" or "common ownership". Thus, according to OECD definitions, common ownership might ultimately refer to the case in which a third party, generally an investor, owns minority equity stakes in different organizations at the same time.

Departing from the mainstream literature, Elhauge (2016) proposes to employ the expression "horizontal shareholding" because, under his extensively formulated view (Elhauge, 2018), the traditional term "common ownership" can also be utilized, at least in principle, to identify shareholders owning stock in two non-authentically competing companies and, consequently, common ownership would include a wider and not homogeneous variety of phenomena, such as vertically-related firms. This latter case is labelled by Elhauge as "vertical shareholding" and, although potentially connected with horizontal shareholding, it is deemed to prompt distinct effects.<sup>4</sup> These effects, however, are likely to ultimately exacerbate the outcomes of horizontal shareholding, as

<sup>&</sup>lt;sup>3</sup> He and Huang (2017) define institutional cross-holdings as the condition in which an institution simultaneously holds more than one block of shares in the same industry at a given point in time. The authors consider a block to be in place when the institution's participation in a firm's capital is at least 5%. However, there is no unanimous consent on how large a stake should be in order to be considered a block (because this is also liable to depend on the stakes of the other shareholders). Seldeslachts et al. (2017), for example, adopt three thresholds (1%, 3%, 5%) in order to provide robustness to their analysis.

<sup>&</sup>lt;sup>4</sup> According to Elhauge (2018), the presence of vertical shareholdings may induce one of the verticallyrelated organizations to rebuff deals with rivals of the "vertical-partner" as well as to charge higher prices to such rivals.

highlighted in a Note by Portugal to OECD (2017). Thus, Elhauge's categorization is aimed to address separately (mainly for regulatory purposes) two dimensions of a unique species but, to be fair, under the perspective that vertical shareholdings do not prevent anticompetitive harms, as instead is stated in Hemphill and Kahan (2018). Furthermore, the need to distinguish horizontal shareholding from vertical shareholding is justified by highlighting that different institutional investors do not necessarily hold similarly-sized investments in horizontally-related and vertically-integrated corporations (and these figures are likely to differ also according to the market under analysis)<sup>5</sup>. Thus, the risk of including them in a broad category might generate confounding effects. For the purpose of our study, we might adopt the expression common ownership to be aligned with mainstream literature such as Azar et al. (2018), Dennis et al. (2018) or also indirect crossownership, as in He and Huang (2017). However, given that our empirical analysis is shaped on the latter research, we will privilege the use of the expression "crossownership" to describe the phenomenon and its implications.

Such a debated terminology, finally, proves to be substantially consistent with the definition provided by the U.S. Antitrust Agencies: the U.S. Department of Justice (Antitrust Division) and the Federal Trade Commission define the expression common ownership as the "simultaneous ownership of stock in competing companies by a single investor, where none of the stock holding is large enough to give the owner control of any of those companies". Thus, the only element added by this last definition is that common ownership is regulatorily connected to non-controlling participations, while

<sup>&</sup>lt;sup>5</sup> Elhauge (2018) states, for instance, that Index Funds tend to hold stock in vertically-related organizations in larger proportions than horizontally-connected firms.

<sup>6</sup> Note by the United States-OECD (2017)

previous definitions did not provide precise criteria on whether a participation should be a control or non-control one as to decide whether it is possible to talk specifically of common ownership.

#### 2.4. Theoretical approaches on competition

In order to grasp the actual connection between cross-ownership and competition, first it is advisable to identify which theoretical approaches are traditionally employed to scrutinize the issue of competition in any, unspecified industrial sector. Following the framework set up by Trivieri (2005), three different lines of reasoning may be highlighted: Structure-Conduct-Performance paradigm (SCP), Efficient Structure Hypothesis (ESH), New Economic Industrial Organization approach (NEIO). According to SCP, the level of competition within a market strictly depends on the conduct of its firms which, in turn, is differently shaped on the basis of the structural characteristics of the reference market (such as the condition of demand and supply, price, size and number of firms). Thus, a structural modification towards greater concentration in a given sector is liable to prompt changes in firms' behaviour (for instance, stimulating coordination among existing market participants) and this may ultimately lead to a weakened competition. To sum up, higher concentration might lead to a reduced competition.

ESH, while rejecting such a strict correspondence, connects a stronger industry concentration to an increased degree of efficiency in the whole sector of interest. The underlying reasoning is that, taking the overall size of a market as fixed, the most efficient firms gradually gain wider market shares at the expense of their less efficient competitors and, therefore, concentration would be the outcome of intense competition.

The third approach is based, instead, on non-structural models, that is on schemes developed not simply relying on information related to the structural features of markets and is thus aimed to be more flexible than the previous two alternatives, adapting and changing shape on the basis of the specific market under analysis. To that end, two main empirical methods are adopted: one concerning the conjectural variations7 proposed by Lau (1982) and Bresnahan (1982) and the other based on the H statistics of Rosse and Panzar (1977) and Panzar and Rosse (1982, 1987). This last statistic is derived from static (oligopoly) models, which determine equilibrium (in terms of output and number of firms) by maximizing profits at two levels (firm and industry) and it allows to identify the nature of the market structure to which a company belongs by estimating the sum of the elasticities of the company's revenues vis a vis its input prices. Formally, if we denote with R the firm's revenues, w a vector of K input prices (k = 1, 2, ..., K), Z and S two vectors including exogenous variables shifting a company's revenues and cost functions,  $\varepsilon$  the error term, the reduced-form firm's *i* revenues function is given by:  $R_i =$  $f(w_i, Z_i, S_i, \varepsilon)$ . According to Panzar and Rosse (1987), a firm's market power can be measured by the degree to which changes in input prices  $(\partial w_{k_i})$  are reflected into changes of equilibrium revenues  $(\partial R_i^*)$  earned by firm *i*. *H* is then defined as the sum of the elasticity of total revenues w.r.t. input prices:  $H = \sum_{k=1}^{K} \left( \frac{\partial R_i^*}{\partial w_{k_i}} \frac{w_{k_i}}{R_i^*} \right)$  and H=1 if firms operate under perfect competition;  $H \leq 0$  in case of monopoly or perfectly collusive oligopoly;  $0 \le H \le 1$  if there is monopolistic competition with freedom of entry.

<sup>7</sup> An indicator of the market power of an organization is obtained solving simultaneously three equations (supply, demand, prices). This method tends to be more data demanding with respect to the H statistic.
8 The H statistic is determined starting from a reduced-form revenues function at individual firm level and, in this way, it allows to discriminate between different market structures.

#### 2.5. Economic theories of the link between cross-ownership and competition

A broad range of literature contributions predict that within-industry diversification of institutional shareholders' investment decisions might stimulate a lessened competition in portfolio firms' product markets. From a theoretical viewpoint and following the approach of Azar et al. (2018), we may exemplify the baseline situation by considering the case of an industry formed by two equally-sized companies, namely A and B. Supposing that A undercuts the prices of B's products to entice a larger customer base, the resulting gain in market share for A will come at expense of B, with A being able to potentially benefit from such a move by selling many more units of products charging only slightly lower prices. Overall, average market prices are lower (because B's prices are supposed not to vary) and the larger demand for A's products is only the result of a shift of B's costumer base to A. From the perspective of these companies' owners, the loss in revenue for B's shareholders will be larger than the increased theoretical gain for A's stockholders, given the different prices charged by the two corporations. This means that, if an institution (or in general an investor) held shares (for simplicity, equally-sized stakes) in both firms, it might be liable to suffer a net loss in case of price competition and, thus, one may conclude that an intensification of cross-ownership would be reasonably expected to trigger a milder competition as well as a price-setting behaviour similar to the one recognizable if A and B were two divisions of a monopoly rather than two independently managed companies.

Reduced competition as a consequence of cross-ownership might also be channelled by changes in research and development expenses, as theorized by Lòpez and Vives (2016) and Seldeslachts et al. (2017). Again, we may depict the basic transmission channel by considering two competing firms, A and B, belonging to a specific market and we should

suppose that each firm's management aims at maximizing its own shareholders' interests when deciding the level of R&D investments to be set so as to compete with sameindustry peers (in this case, only one competitor). It might be useful to compare the implications of two opposite ownership frameworks in this context. First, if the ownership structure of A and B is composed by completely distinct natural or legal persons, the decision on R&D investments is likely to be taken independently by each firm in order to maximize its own profits. If, to the contrary, we suppose that there is a common layer of shareholders between A and B (for instance because a subset of A's stockholders has acquired shares in firm B too), profits become linked and managers in each organization will necessarily take into account that some of their shareholders do care also about the other firm's profits. This may alter choices in terms of R&D expenses because these firms, once cross-owned, may have less incentives to compete aggressively, which might turn out to be to the detriment of consumers via price coordination or explicit collusion. This same stylized model, however, might lead to a different outcome if we introduce another condition: suppose that A and B are not the solely market participants, but also C operates in the considered market. If A and B have distinct owners, they may timidly invest in innovations as these may spill over onto rival firms and information might be stolen to gain benefits from the result of research activities without incurring its costs. Thus, free-riding fears hinder innovations. If instead A and B are cross-owned, they may coordinate their innovation activities, even via research alliances, resulting in potentially more efficient production processes, which may lead them to erode part of C's market shares (which is not even partially detrimental for A and B shareholders) and could also benefit consumers.

All in all, scholars have distinguished both positive and negative effects on competition stemming from cross-ownership but, before inspecting them more systematically, two points need to be stressed in order to understand the "perimeter" of cross-ownership and its competitive implications: the outcomes we depicted so far are likely to occur even in the absence of direct or formal communication between managers and shareholders (because managers are expected to implicitly consider their shareholders' interests in decision making activities, without the need for formal or informal meetings between management and stockholders); effects do not occur only if shareholders have majority interests in the firms where they invest because even investors with minority ownership stakes in two rival firms would automatically force the managers of a company to place at least some weight on a rival's profits, as noted by O'Brien et al. (2000).

Concerning the idea of cross-ownership being a trigger of competitive harm, Seldeslachts et al. (2017) split the discussion into two dimensions: first, the incentive for institutional cross-holders to dampen competition; second, the ability of these same investors to influence decisions (of whichever kind) in firms where they hold stakes in such a way to pursue their own interests. The first branch can be theoretically further divided into competitive issues arising from unilateral effects and those stemming from coordinated effects.

#### 2.5.1. Unilateral effects of cross-ownership

Unilateral effects are associated with price increases (or, alternatively but coherently, declines in the quality and variety of products and services) that are introduced exclusively by one market participant and they are usually studied in contexts of imperfect competition. In a perfectly competitive market (with also product

homogeneity), in fact, there would not be benefits for a firm to charge higher prices with respect to its competitors because enough costumers would switch to rivals, thus making deviations from the market equilibrium unprofitable in the short as well as medium-tolong term. Instead, in case of an imperfectly competitive market, we would have a situation similar to that analysed by Salop and O' Brien (2000). The model set up by these last authors is based, in turn, on contributions by Bresnahan and Salop (1986) as well as Reynolds and Snapp (1986), providing a framework to study common ownership (or better, cross-ownership) under Bertrand and Cournot competition. The basic model works in the following fashion: consider two firms, A and B, and suppose that A is pondering a unilateral price increase. This move, as seen before, would be constrained because higher margins deriving from higher prices may not compensate for the resulting loss of customers, with elasticity measured by means of a diversion ratio (customers shifting from a supplier to a cheaper one). A's calculus, however, would change if A had a minority (non-controlling) stake in B: some of the clients leaving A would shift to B and a fraction of B's larger profits would accrue to A. As a consequence, A's lower profits deriving from a narrowing of the customer base could be partially mitigated by A's minority ownership of firm B and this can represent a "safety cushion" for upward pricing pressure. In practice, the outcome of such a strategy would depend on a range of factors, including the size of A's interest in B, the magnitude of price increases, the profitability levels of the two corporations, the degree of concentration within the industry). However, according to Patel (2017), the market-level feature that has to be primarily analysed in these cases is the level of product differentiation in the relevant market, which is the ultimate trigger of customers substituting the product of a company with that of another one.

#### 2.5.2. Coordinated effects of cross-ownership

Coordinated effects, on the other hand, are examined among the others by Rock and Rubinfeld (2017) and they basically originate from a cross-holder acting as a "cartel-ringmaster", meaning that an institutional investor takes advantage of its multiple ownership stakes in an industry by facilitating coordination among its portfolio firms, which is practically carried out by means of passing information from a party to another and monitoring compliance.

The consequent theoretical gains, according to the authors, are represented by a share of the excess rents earned by each firm but such a behaviour would be easily detectable by competition (antitrust) authorities as being similar to the role exercisable by an industry association in order to facilitate cartel conduct. Not by chance, the same study also stresses the importance for investors with holdings in competing organizations to abstain from discussing pricing policies and other topics that might stimulate collusive agreements. To be more precise, it is not necessary to have cross-ownership to create an incentive for colluding but it may certainly provide an incentive for horizontal shareholders not to deviate from pre-existing collusive behaviours because the gains arising from deviation would, in a context of common ownership, be at least partially cancelled out by the loss of collusive profits related to other commonly-held corporations. This, in turn, may mean in principle that if collusion is there and a cross-block of shares is set up, then such collusive conduct will be automatically strengthened further. However, in order to produce an impact on the likelihood of firms deviating from collusion, an investor must be ready and willing to play an active role in cartel coordination. Even in that case, nevertheless, the actual effect of cross-ownership on the sustainability of collusion might not be straightforward. Rock and Rubinfeld (2017), for instance, highlight that in highly concentrated markets, where there is a reasonable chance that coordination enabled by cross-ownership will drive to successful outcomes (for horizontal shareholders), one cannot directly conclude that parallel pricing and output restrictions/limitations come as a consequence of common ownership.

The underlying reason is that corporations may be induced to tacitly collude regardless of ownership connections. Besides, Patel (2017) also recognizes that, differently from what stated so far, common ownership may sometimes provide an incentive for corporations to deviate from collusive agreements: while this phenomenon can theoretically increase the likelihood of collusion by making it easier for corporations to set up and monitor collusive behaviours, cross-ownership might also reduce the probability of observing collusion by lowering the cost of punishment if it produces unilateral effects and, in particular, the idea is that a non-cooperative outcome resulting from punishment would be better than the one without cross-ownership9. To be more straightforward, the reasoning is that shareholders' varying common-ownership interests can potentially reduce competitive harm because shareholders are likely to have different preferences concerning the degree of competition they would like to set up and this makes it more difficult to observe coordination. Further, even shareholders with exactly identical interests in rival corporations may have some ownership interests in companies outside of the relevant market and this can create differences in terms of preferences regarding the extent to which firms belonging to the relevant market should compete less. Thus, if differing preferences cannot be suitably reconciled, then there will be little chance to

<sup>9</sup> Overall, the impact of common ownership on the possibility of observing tacit collusion is liable to depend significantly on whether an industry is already subject to collusion and on the actual ability of one or more investors to stimulate and establish collusive behaviours.

pursue the strategy to which one or more firms compete less and act to the detriment of the customers.

#### O'Brien and Salop (2000) model applied to horizontal shareholdings10

Consider a market consisting of firms offering homogeneous products and engaging in quantity (Cournot) competition. Several investors may hold stakes in the considered corporations and each firm's managers maximize a weighted sum of their shareholders' return, with the weights being stockholders' control interests (fractional share interests) in each firm and a shareholder's return being the sum of the profits he/she obtains from all the within-market firms in which he/she owns shares.

To exemplify, suppose the market is populated by two firms, A and B, and each of them has two shareholders. Investor 1 appears in the ownership structure of both companies, investor 2 is a shareholder of A only and investor 3 is exclusively a stockholder of B. If shareholder 1 has a 50% stake in A and 20% stake in B, A's managers choose the level of A's output so as to ultimately maximize  $\frac{1}{2}p_1 + \frac{1}{2}p_2$ , while B's managers maximize  $\frac{1}{5}p_1 + \frac{4}{5}p_3$  (pi denotes investor's i profit). Investor 1's profit, p1, is equal to  $\frac{1}{2}p_A + \frac{1}{5}p_B$ . Investor 2's profits correspond to  $\frac{1}{2}p_A$  and investor 3's profits are equal to  $\frac{4}{5}p_B$  (p denotes firm's j profit). Considering their shareholders' interests comprehensively, firm A's managers select the corporation's output in such a way to maximize  $\frac{1}{2}(\frac{1}{2}p_A + \frac{1}{5}p_B) + \frac{1}{2}*\frac{1}{2}p_A = \frac{1}{2}p_A + \frac{1}{10}p_B$ , while B's managers maximize  $\frac{1}{5}(\frac{1}{2}p_A + \frac{1}{5}p_B) + \frac{4}{5}*\frac{4}{5}p_B = \frac{1}{10}p_A + \frac{17}{25}p_B$ . Without cross-ownership,

<sup>&</sup>lt;sup>10</sup> The original model is applied to the framework of common ownership by Patel, M., 2018, "Common Ownership, Institutional Investors and Antitrust", Antitrust Law Journal, Vol. 82, n.1.

managers would exclusively take into consideration the profits generated by their respective corporations. In our case, instead, the managers of each firm partially take into consideration the output level of the other corporation but, given that the rival firm's profits are likely to increase if a firm lowers its own output, cross-ownership provides an incentive for managers to compete less. In order to recognize this, suppose that the inverse demand for the market product is P=10-Q, where P is the market price of the homogeneous products and Q is aggregate quantity. Assume the two firms have both a marginal cost of 5. Then, if there is no cross-ownership, the managers of each firm set quantity equal to 1.67. Aggregate quantity will be 3.33 and the associated market price is 10 - 3.33 = 6.67. If there is cross-ownership as depicted above, the two firms no longer produce 1.67 each. Instead, holding constant firm B's quantity at 1.67, firm A's profit-maximizing quantity is 1.5. Similarly, holding fixed A's output at 1.67, B's profit maximizing quantity is 1.54. However, 1.5 and 1.54 do not constitute Nash equilibrium quantities because each of the corporations assumes that the other produces 1.67. After firms take into account the change in output by the rival in such a way to reach a Nash equilibrium, A sets the output level equal to 1.52 while B sets output equal to 1.63. Translating this into aggregate quantity, the one associated with shareholder 1's stake in A and B is 1.52 + 1.63 = 3.15 and the corresponding market price is 10 - 3.15 = 6.85. All in all, quantity is lower and prices are higher than the situation of no cross-ownership, which makes consumers worse off. Thus, horizontal shareholdings have generated competitive harm and it widens as investor 1's stake in B goes up.

#### 2.5.3. Translating cross-owners' interests into policies

Once defined both the unilateral and coordinated competitive effects arising from crossownership, the question to be addressed is whether board members and management of firms with at least some shareholders in common will act according to their broad interests (at portfolio-level and industry-level) rather than firm-specific ones.

The primary way in which cross-ownership by institutional investors might translate into anticompetitive conduct is if horizontal shareholders exert direct influence so as to incentivize such a kind of behaviour. Theoretically, in order to exert direct influence on decision-making bodies, it would be necessary for a stockholder to hold a block of shares allowing him/her to have effective control or at least sufficient influence. For institutional investors, this might prove difficult *de jure* at least at first glance because they usually hold minority stakes, but Azar (2017) isolates two ways through which influence can be exercised, generally speaking: voting and voice.

If an investor holds stock with voting rights, he/she is entitled to vote, according to OECD (2015), on a variety of corporate matters such as the Board of Directors' membership, the company's strategy, executives' pay packages. Thus, theoretically, an investor may encourage anticompetitive behaviours by selecting the Board's members and the firm's strategy accordingly but the final outcome would depend on a wide set of factors. Among them, OECD (2017) highlights that, if undiversified investors collectively hold more shares with voting rights with respect to diversified investors (like institutional investors), the strategic decision would be expected to be defeated (given the misalignment in terms of preferences between the two groups). The same document, nevertheless, acknowledges

that in practice this may not be always the case. In fact, a majority of shares may not be required to influence a resolution for several potential reasons, such as the following ones:

- Iow levels of shareholder general meeting attendance and scarce vote engagement among non-institutional minority investors like individuals may emphasize the influence of institutional investors;
- institutional investors hold, in many cases, larger portions of shares with respect to remaining stockholders (and free float shares available for trading can further amplify institutional investors' ability to influence decisions);
- when institutional investors act as if they were a unique body (thus forming a stable voting coalition), their impact can be decisive (and this effect tend to be strengthened by the reliance of institutional investors on a small set of proxy advisors, such as Institutional Shareholders Services and Glass Lewis)11.

To the contrary, there are arguments against the possibility of stimulating anticompetitive behaviours and agreements via voting:

- institutional investors may have diverging interests, which undermines the stability of voting coalitions. Heterogeneity and rapid changes in institutional investors' portfolios work as a barrier to a common voting block;
- votes by institutional investors that dissent from management recommendations are usually rare as proved by OECD (2011), and according to GAO (2016) many institutional investors employ proxy advisory organizations to express voting recommendations that would not consider common ownership connections;

<sup>&</sup>lt;sup>11</sup> For instance, the process of empowering the stability of voting coalitions by means of few proxy advisors is studied by Muraca and Freeman (2017) with an analysis focused on Austrialian corporations.

- influence via voting is limited because the fields on which shareholders can decide are themselves limited
- other investors could have an incentive to defeat anticompetitive strategies that provide benefits to institutions with shares in the firm's rivals.

Overall, it is not straightforward whether common owners can rely on voting as to influence a firm's competitive behaviour. Rather, Azar (2017) defines voting as the "stick" which is used only when the "carrot" of informal engagement through voice does not work. The idea is that investors can exercise influence over managers by directly interacting with them. McCahery et al. (2010) show that institutional investors prefer to engage management and members of the Board of Directors in informal settings to influence managerial decisions. Another way of expressing "voice" is by issuing public statements concerning investors' preferred course of action and demanding wider board representation. Besides, institutional investors' engagements tend to be focused on strategic topics or long-term developments rather than short-term tactical issues. Notably, the survey conducted by McCahery reports that 42% of responding investors believe that threatening to sell shares can be an effective tool to discipline management with no need to vote for management changes.

Some doubts have risen about the extent to which institutional investors can exert influence through voice and, for instance, the threat of selling shares is less credible for passive investors mainly interested in tracking the performance of an index. Also, it is not clear whether institutional investors choose to exert the full range of influence that can theoretically be at their disposal, because they may involve costs that a hugely-diversified investor is not likely to bear. Finally, there might be conflicts of interest between institutional investors that, on the one hand, manage shares on behalf of their clients and, on the other hand, get fees from corporations to manage pension as well as other investment funds, as depicted by Davis (2008).

Beyond direct influence, one can also recognize underlying management incentives in favour of cross-owners' will. Company managers are generally conscious of the identity of their stockholders and they are likely to be remarkably sensitive to the opinions of institutional investors with blocks of shares, seeking to avoid their dissatisfaction even under no explicit threat. Other practical reasons why managers do particularly care about large and diversified shareholders' interests are exposed by Elhauge (2016) and they are, namely: a sense of gratitude, getting support in future elections, enhancing career prospects and self-promotion.

In particular, executive compensation introduces potentially powerful incentives for management to shape the firm's strategy and their own conduct. Variable compensation pegged on the firm performance is traditionally acknowledged among the ways to align shareholders' and managers' interests but Holmstrom (1982) advises that remuneration should be tied to a company's performance relative to the market, as this would alleviate certain agency problems and enhance risk-sharing. However, according to OECD (2009), executive compensation schemes tend in practice to be tied to market-wide performance and not to the performance of a corporation relative to its peers. OECD (2017) adds a further element by highlighting that, by indexing executive compensation to industry-wide performances, management incentives can be suitably aligned to those of diversified institutional investors holding stocks in several firms within an industry and the alignment

would come at the expense of undiversified investors, who would prefer aggressive competition.

An empirical study on such a dynamic is Anton at al. (2016), which finds that executives and top managers are more often remunerated on the basis of industry-wide results (as opposed to firms' relative performance) in case of stronger cross-ownership links. Furthermore, the analysis proves that there is a positive correlation between common ownership levels and unconditional executives' pay, with passive investors not rejecting pay packages, which suggests they are in favour of the status quo.

In the same way as before, the theory according to which managers' remuneration might create an incentive for them to deliberate and act in the interest of diversified investors at the expense of the remaining shareholders has been criticized for being simplistic and utterly misleading. For instance, O' Brien and Waehrer (2017) contend that performancefocused compensation (such as stock options) provide managers with the incentive to maximize their firm's profits and not to boost industry profits at the expense of their ownfirm profit. This last conduct, they argue, would be a breach of the fiduciary duty towards their own firms' shareholders. OECD (2015), in fact, specifies that legislation in several countries sets out for a firm's Board members a duty of care (Directors have to act on a fully informed basis, in good faith, with due diligence and care) and a duty of loyalty (to the company and its stockholders). This implies that, even though managers might be inclined towards pursuing institutional investors' interests rather than undiversified investors' ones (whose influence is likely to be less organized, concentrated, leveraged), such a way of behaving would qualify as a violation of the fiduciary duty and consequently would expose executives to liability. It must be recognized, however, that legal actions for the violation of fiduciary duties may have scarce odds of success, as noted by O' Brien and Salop (2000).

#### 2.6. Traditional measures of cross-ownership and of its effects

#### 2.6.1. The HHI

Several authors have reached different and sometimes contrasting conclusions when studying cross-ownership effects on coordination and competition partly because of the different measures they adopted in order to grasp cross-ownership. The basic idea is that we need a measure that captures the extent to which firms' most powerful owners are also owners of natural competitors and one such measure is the MHHI (Modified Herfindahl Hirshman Index) introduced by Bresnahan and Salop (1986) and further updated by O' Brien and Salop (2000), which is employed by regulators at international level in order to assess whether holdings of a company's shares by a direct competitor may entail competitive concerns.<sup>12</sup>

To begin with, the HHI is a measure of market concentration defined as the sum of the squares of the market shares s (each multiplied times 100) of the N corporations (each indexed by j) belonging to a specific market:

$$HHI = \sum_{j=1}^{N} s_j^2$$

Thus, if N=1, a unique company j controls the entire market and consequently HHI will be equal to 1002=10,000. Obviously, markets with lower *HHI* are considered less concentrated than those with higher HHI levels and, in general,  $0 < HHI \le 10,000$ . Patel

<sup>&</sup>lt;sup>12</sup> The main difference between papers studying common ownership implications and antitrust activity is that, according to Azar et al. (2018), the latter usually does not take into consideration beneficial ownership by financial investors while the former considers all beneficial owners of a firm's shares.

(2018) reports that, in the US, both the Department of Justice and the Federal Trade Commission traditionally screen the HHI as a preliminary step to recognize those mergers that are likely to raise competitive concerns and Courts have extensively relied on this measure so as to gauge anticompetitive effects in litigated merger challenges.

In particular, the evaluation process enacted on the basis of the Horizontal Merger Guidelines prescribes to calculate the post-merger HHI and the change in HHI, but these measures are not decisive in the final approval of a merger, as "HHI has not the purpose of providing a rigid screen to separate competitively benign mergers from badly competitive ones" 13. One of the reasons why HHI is not recognized as the rule of thumb for approving mergers lies in the fact that it does not assess the interrelations among the ultimate owners of the firms under scrutiny.

#### 2.6.2. The MHHI

The MHHI represents overall market concentration and it can be decomposed into two components: industry concentration (HHI) and cross-ownership concentration ( $\Delta$ MHHI), the latter being aimed at grasping the extent to which competitors are connected by cross-ownership and control links. In order to quantify MHHI and by embracing the approach set out by O'Brien and Salop (2000) we first have to assume that firms are Cournot competitors. Using the following notation:

- > N : companies (j=1,...,N)
- > M: shareholders (i=1,...,M)
- >  $x_j$  : output of firm-*j* (revenues)
- >  $X = \sum_{j} x$  : industry output (revenues)

>  $s_j = \frac{x_j}{X}$ : firm-*j*'s market share

> P(X) : inverse demand for X

<sup>&</sup>gt;  $C_j(x_j)$  : cost of output level  $x_j$ 

<sup>13</sup> Horizontal Merger Guidelines (19/08/2010).

- >  $\pi_j = P(X)x_j C_j(x_j)$ : profits in Cournot model
- >  $\beta_{ij}$ : ownership share of firm-*j* owned by shareholder-*i*
- γ<sub>ij</sub> : measure of owner-*i*'s degree of
   control over firm-*j*

The framework is developed as follows:

>  $\pi^i = \sum_j \beta_{ij} \pi_i$ : shareholder *i*'s profit

$$\prod_{j} = \sum_{j} \gamma_{ij} \pi_{i} : \text{total profits}$$

maximized by firm-j management

$$\max_{x_j} \prod_j = \max_{x_j} \sum_i \gamma_{ij} \pi^i = \max_{x_j} \sum_i \gamma_{ij} \sum_k \beta_{ik} \pi_k$$
$$= \max_{x_j} \sum_i \gamma_{ij} \sum_k \beta_{ik} \left[ P(X) x_k - C_k(x_k) \right]$$

The first-order condition is:

$$\sum_{i} \gamma_{ij} \left\{ \sum_{k} \beta_{ik} P' x_k + \beta_{ij} [P - C'_j(x_j)] \right\} = 0$$

If we multiply through by X/X and 1/P, the above condition can be rewritten as:

$$\sum_{i} \gamma_{ij} \sum_{k} \beta_{ik} \left(\frac{P'X}{P}\right) \frac{x_k}{X} + \sum_{i} \gamma_{ij} \beta_{ij} \frac{P - C'_j(x_j)}{P} = 0$$

Which, once rearranged, becomes:

$$\frac{P - C'_j(x_j)}{P} = \frac{1}{\eta} \sum_k \frac{\sum_i \gamma_{ij} \beta_{ik}}{\sum_i \gamma_{ij} \beta_{ij}} s_k$$

Multiplying both sides by  $s_j$  and summing over all j yields:

$$\sum_{j} s_{j} \frac{P - C_{j}'(x_{j})}{P} = \frac{1}{\eta} \left[ \sum_{k} \sum_{j} \left[ \frac{\sum_{i} \gamma_{ij} \beta_{ik}}{\sum_{i} \gamma_{ij} \beta_{ij}} \right] s_{k} s_{j} \right]$$

Within the standard Cournot model without partial ownership, the term  $\sum_{k} \sum_{j} \left[ \frac{\sum_{i} \gamma_{ij} \beta_{ik}}{\sum_{i} \gamma_{ij} \beta_{ij}} \right] s_{k} s_{j} \text{ would equal HHI} = \sum_{j=1}^{N} s_{j}^{2}. \text{ In case of common ownership, the}$ 

MHHI is equal to the term  $\sum_{k} \sum_{j} \left[ \frac{\sum_{i} \gamma_{ij} \beta_{ik}}{\sum_{i} \gamma_{ij} \beta_{ij}} \right] s_k s_j$ . If we separate out the terms for which

k=j, then MHHI can be written as:

$$MHHI = HHI + \sum_{j} \sum_{k \neq j} \left[ \frac{\sum_{i} \gamma_{ij} \beta_{ik}}{\sum_{i} \gamma_{ij} \beta_{ij}} \right] s_k s_j$$

where the second term is  $\Delta$ MHHI.

Three key insights that the above formula allows us to capture are the following ones:

- common ownership effects are positively related to the size of the overlapping shareholders, as can be noted from the numerator of the fraction;
- the degree of competitive concern originated by cross-shareholding of companies
   j and k is proportional to the share-weighted average ownership stake in firm k of
   owners of company j;
- the level of competitive concern is smaller to the extent that there are particularly large self-owners of firm j. A large self-owner of company j will have, because both of his/her weight in the corporation's calculations and the weight of the value he/she earns from the firm, a strong interest in ensuring that the company maximizes its own profits. Thus, the implication is that minority shareholders do not represent a threat to competition so long as there is some large concentrated stockholder because the collective action problem, together with small ownership stake size, would prevent non-controlling shareholders from exerting much influence over the company.

In order to better understand the implications of this indicator and the logic behind its computation, we can set out a numerical example. Consider an oligopoly (we hypothesize to consider the airline industry) composed by 4 equally sized companies having each 25%

market share, for the sake of simplicity. The HHI is  $4*25_{2}=2500$ . Suppose the companies' main shareholders are 5 institutional investors and assume that, in a first scenario, they hold each 20% of every firm in the market (thus, they are the only shareholders). If this is the case,  $\Delta$ MHHI is equal to 7500 and, combined with HHI, it results in full monopolization (MHHI=10,000). If, instead, we set each investor's ownership stake equal to 5% in one company and 1% in the remaining ones (we hypothesize that the first two funds have both 5% stake in the first company, while the remaining 3 companies only have one block-holder and we further assume that remaining non-cross-holding shareholders have negligible stakes),  $\Delta$ MHHI drops to 3,381.6. If blocks are equal to 10% rather than 5%,  $\Delta$ MHHI has a further slump to 1,701.8. If, however, asymmetry is reduced by making the base stakes of the other funds 5% instead of 1%, then  $\Delta$ MHHI rises back to 6,519.9 and if we set all participations equal to 5% (and assuming that the remaining 80% ownership stakes of these companies is in the hands of highly diversified investors, each with a negligible stake, so that there is a widely dispersed ownership based except for the five institutional investors),  $\Delta$ MHHI goes back to its maximum, 7500.

FIGURE 1 depicts the basic scheme we personally developed and utilized in order to calculate the above measures, displaying in particular the results when main blocks are 10% and other stakes are 5%. What we can deduct from this example is that, if there is no or very limited concentrated shareholding in a company, then even small highly diversified holdings by institutional investors can be sensibly problematic. In fact, if there is literally no concentrated holding in a corporation, then, independently of how small the holdings of each institutional investor are, the model predicts that they achieve the same harms to competition that would accrue to monopoly. Though superficially counterintuitive, the underlying logic is elementary: someone has to determine the

company's goals and such controller is likely to be the largest shareholder. If, however, there is no concentrated ownership, then the corporation will be run in the interests of the institutional investors holding its stocks, even when they do not individually own large stakes in absolute terms.

MHHI measures work properly when horizontal shareholding reflects the presence of either a small common set of investors holding shares of competing companies or some firms owning stocks of competing firms. However, this formula needs to be adjusted if there is either a mixture of common shareholding and firm cross-ownership or mutual cross-shareholding among rivals. In those cases, the indirect control requires to solve for the ultimate financial interest before applying the formula, and the result is labelled GHHI (Generalized Herfindahl-Hirshman Index).

Backus et al. (2018) criticize the use of MHHI for two reasons, whose common element is the fact that this measure ends up conflating cross-ownership incentives with market shares. The first reason is related to the structure-conduct-performance literature and in particular the problems that may arise from treating functions of market share as independent variables. The second reason lies in the difficulty to introduce a precise market definition. As a consequence, the authors propose to deepen the analysis by calculating the implied cross-ownership profit weights and control weights.
#### FIGURE 1

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(*) Vanguard ownership stake in Delta Airlines times Vanguard ownership in American Airlines (AMHHI) (6519)		DEN	25	25	25	25	100	200	0.9	025	546.9
(7) yanguard ownersnip stake in Deita Arrines times yanguard ownersnip in American Airlines <b>AMHHI 651</b>		(h) 1/1	in autoria D	In Abilian -			- A			AMITTI	6510.4
		(*) Vanguard ownershi	ip stake in D	eita Airlines ti	mes Vanguard	ownership i	n American A	runes		ΔΜΗΗΙ	6519.9

The figure on the left displays an example that we personally developed in order to understand the computation of  $\Delta$ MHHI. We hypothesize to analyse the airline market, supposing that it is constituted by 4 companies, each with a 25% market share and with 5 cross-holding institutional investors (owning stakes either equal to 5% or 10%). For each couple of companies in the market (indexed from a to d) for instance Delta Airlines and American Airlines - , we first calculate the product of ownership stakes held by each cross-holder and sum them up. We then take the ownership stake of each investor in the first of the two companies in the couple - i.e. Delta Airlines in our example - at the power of two and subsequently sum them up.

We subsequently take the ratio between the two numbers and we multiply it by the market share product, which is the product of the market shares of the companies in each couple. The sum of the products among ratios and combined market shares is  $\Delta$ MHHI.

#### 2.6.3. He and Huang Measures

Instead of evaluating market concentration by means of MHHI, He and Huang (2017) construct five measures for analysing the cross-ownership status of a company in a given fiscal year. The fundamental purpose behind this computational choice has to be found in the attempt by He and Huang to create an analysis that may include each and every industry rather than a single industry and at the same time to grasp cross-ownership using statistically reliable measures without the need to have a huge amount of data for each industry.

Cross-dummy is a variable computed for each company and which takes a value equal to 1 if in the ownership structure of the firm there is at least one institutional investor holding a block of shares both in the firm and in at least one competitor.

The second measure is NumConnected and it corresponds to the number of rival firms with common institutional block-holders, meaning the number of companies in the same industry having at least one block-holder in common with the corporation under analysis.

The third measure is NumCross, which represents the number of unique institutions that cross-hold the company (institutional investors having at least one block in the firm and in one competitor of such firm). Operatively, it is equal to the sum of the cross-held (and block-held) individual dummies for each corporation.

The fourth measure, AvgNum, is the number of same industry peers block-held by the average cross-holding institutional investor. This variable can be conceived as a fraction whose numerator is the sum of the number of companies block-held by each cross-holding institution and whose denominator is the total number of cross-holding

institutions in a company. As such, the fourth measure is nothing more than the ratio of the second measure over the third one. Its objective is to capture the intensity of commonholding activities for the average institutional investor and its resulting incentive to take an active stance in order to influence the corporate policies of the common-held corporations.

The fifth measure is TotalCrossOwn, which is the sum of holding percentages for the different cross-block-holders in each company. It is aimed at capturing the potential aggregate influence of all common holders on firm management.

#### 2.7. Empirical evidence on the anticompetitive outcomes of common ownership

The following discussion aims to provide an overall, but not fully exhaustive, treatment of the empirical evidence about the connection between cross-ownership and anticompetitive repercussions for some key industries where oligopoly seems to be more evident.

#### 2.7.1. Airline industry

One of the first studies to highlight the link between common ownership and anticompetitive effects is Azar et al. (2018), which takes advantage of the fact that, for the US airline industry, public data are available on ticket prices and the number of passengers for each specific route. Thus, for each possible route the authors compute HHI, MHHI and  $\Delta$ MHHI and they find that, for the average airline route, the HHI (which ignores horizontal shareholding) has ranged over time (in the time window from the first quarter of 2001 to the fourth quarter of 2014) from approximately 5000 to 5400 and  $\Delta$ MHHI went from 1000 to 2600, thus resulting in a MHHI spanning from 6000 to 8000. Second, and most importantly, they show that higher levels of  $\Delta$ MHHI (that is, more intense horizontal shareholdings) increased ticket prices at a 99% confidence level and that average prices were ultimately 3-5% higher than they would be in the absence of horizontal shareholdings. Further, higher levels of  $\Delta$ MHHI have also been related to a decrease in quantity with a 99% level of statistical confidence (which excludes the existence of endogeneity or reverse causation), with the average quantity reduction across all routes being equal to 6%. Finally, they show that the effect of  $\Delta$ MHHI on prices becomes significant only when the base market HHI is above 2500, which has important antitrust policy implications<sup>14</sup>.

At least two papers have purported to demonstrate that common ownership does not increase airline pricing by re-running Azar et al. (2018) paper (even before its publication on the Journal of Finance) under a different set of assumptions.

Kennedy et al. (2017)<sup>15</sup> reconstruct the dataset of the reference paper and replicates its results but adopting three main changes: MHHI and  $\Delta$ MHHI are replaced with the Kennedy's own construction of horizontal shareholder incentive terms; the instrument of the instrumental variable regression is changed; the paper creates its own model of market demand and supply. By means of these modifications, no statistically significant evidence is found for common ownership to be a driver of airline prices. Elhauge (2018), however, argues that this paper eliminates statistically significant results only by incorrectly either adopting an instrumental variable that is negatively correlated with horizontal

<sup>&</sup>lt;sup>14</sup> US Federal Antitrust Agencies decided in 2010 to raise the HHI threshold from 1800 to 2500 to determine when a market is highly concentrated enough that higher degree of concentration is likely to originate anticompetitive effects.

<sup>&</sup>lt;sup>15</sup> This paper was funded by the Investment Company Institute (ICI), an association of institutional investors.

shareholding or embracing a market model that wrongly assumes that longer routes have lower marginal costs (and also using only one tenth of the actual data available).

Dennis et al. (2018) does not find empirical evidence on the relationship between common ownership and ticket prices in the airline industry by reconstructing Azar et al. (2018) dataset. Again, what leads to a different set of results is the methodology used, rather than the starting raw data sample. In order to measure horizontal shareholding levels, the authors adopt the raw shareholdings reported on 13F forms by institutional shareholders with more than \$100 million in assets, which is liable, according to Elhauge (2018), to fail in some cases to aggregate shares held by different funds within a common fund family. Despite this last criticism, Dennis et al. (2018) has attracted the favour of most of academia, which has instead been critical of Azar et al. (2017).

#### 2.7.2. Banking Industry

Azar et al. (2016) study the banking sector in the US by analysing deposit account rates and maintenance fees in relationship with cross-ownership, with the following findings: the average HHI in banking markets is around 2,000; when horizontal shareholdings are taken into consideration, the average GHHI reaches values close or slightly above 4,000; though changes in HHI fail to correlate with changes in deposit rates or fees, variations in GHHI have large and statistically significant effects, with greater GHHIs increasing the fees that banks charge and lowering the deposit rates that banks are likely to pay.

Gramlich and Grundl (2017) re-runs the above study using various modifications that result in smaller and more mixed effects, for two main reasons: the critique uses the institutional shareholdings reported in the 13F data, thus failing to aggregate shares voted by a specific fund family as a whole; it modifies the MHHI measure so as to exclude its market share and market concentration components, meaning that only average horizontal shareholding levels are considered while market concentration levels are neglected, thus making their measures far less sensitive to anticompetitive effects. The ultimate outcome is that effects on competition are likely to incorporate more noise and a clear common pattern is impossible to be observed.

#### 2.7.3. Pharmaceutical Industry

Two studies have shed some light on the anticompetitive implications of common ownership within the pharmaceutical sector. Gerakos and Xie (2018) find that institutional common ownership (measured by the weight of the main shareholders' ownership stake in the brand-name company relative to the same investors' holdings in the generic manufacturer) is positively and significantly associated with the likelihood that the two companies will enter an agreement by means of which the brand pays the generic to stay out of the market. In particular, horizontal shareholding results in a 12% increase in the probability that the two firms will enter into payment settlements that substantially delay generic entry and originate a larger delay of the entry.

Newham et al. (2018), similarly, study the phenomenon of market entry in the US and find that increased common ownership among drug manufacturers and potential generic entrants drives down the odds of generic drug producers entering the market by 9-13%.

### 2.7.4. Agricultural Industry

Clapp and Torshizi (2019) study the effects of horizontal shareholdings in the US seed sector over the period 1997-2017 and find that increases in common ownership are associated with higher levels of soy, corn and cotton seed prices. In particular, the author show that approximately 6.2-14.6% of maize, soybean and cotton seed price increases in

the 20-year time window under analysis are attributable to common ownership, after controlling for other crucial supply and demand drivers such as market concentration, intellectual property rights protection, innovation, path dependency in seed prices. Another paper, Clapp (2019), focuses on publicly traded transnational agri-food companies and, besides certifying a rise in common ownership of agri-food companies by large asset management firms, it makes the case that this pattern has the potential of contributing to an already concentrated market power as the one recognizable in this industry.

Backus et al. (2018) investigate the ready-to-eat cereal industry and find that the implied price effects of common ownership are large and, in particular, larger than the price effects predicted as a consequence of mergers that would be blocked out of antitrust concerns.

#### 2.8. Hypothesis development

Starting from the original framework on common ownership developed by O'Brien and Salop (2000), one or more shareholders holding shares in firms competing within the same industry may have the incentive to trigger a mild competition, rather than to enhance it. Such attitude can be studied by analyzing, as done by He and Huang (2017), how companies' market shares and operating profitability change as a consequence of common ownership variations and testing for the presence of competitive outcomes coming from horizontal holdings. In particular, these last authors reverse the discussion with respect to O'Brien and Salop and hypothesize (and demonstrate with reference to the US) that cross-ownership by institutional block-holders stimulates product market coordination and enhances product market performance (meaning that, as cross-

ownership indicators become larger, the firm is likely to encounter a product market share growth as well as an increase in the operating profit margin) for the reasons that will be explained below. By controlling for different potential determinants of market share mutations, we want to test the same hypothesis and we express it in the following fashion:

# H1: cross-ownership by institutional block-holders serves as a trigger for strengthening companies' competitive position and boosting product market operating performance

More specifically, depending on the results of the analysis, we might end up in one out of 3 scenarios. The first case is that of a positive and statistically significant relationship between common ownership and market share growth (as well as between common ownership and operating profitability) in an industry, meaning that institutional blockholders do manage to exert influence over the companies' policies by leveraging on coordination and playing a bridge-building role (which is the result found by He and Huang). The competitive position of a company (measured by its market share evolution) might be enhanced through the formation of strategic alliances among cross-held companies or also by sharing resources, lowering production and distribution costs and avoiding duplication of R&D efforts, thus improving the operating profit margins. All these synergies, however, cannot be entirely and directly attributed to common ownership. In fact, managers of same-industry firms may interact with each other and reach strategic collaboration without any support of cross-holders. Thus, what this scenario implies is that common ownership might help to strengthen collaboration as well as profitability beyond the levels that could be reached by these corporations on their own.

He and Huang (2017) highlight two main theoretical reasons why common ownership may be pivotal in intensifying efficiency, collaboration and competitiveness among sameindustry companies: mitigation of incomplete contracting and reduction of informational asymmetries. The first factor is related to the fact that companies considering collaboration with competitors in the same industry may be concerned about the possibility of being expropriated by their counterparties. As a consequence, firms may withdraw potentially beneficial agreements with rivals. However, if there are common shareholders, they may align incentives and thus preserve strategic collaborations. Some of the firms involved in this type of agreements may be induced to deviate from cooperation for reaching short-term gains at the expense of their counterparties. Nonetheless, common owners can both monitor and punish deviating parties by isolating them for the purpose of new collaborations. The second factor derives from the tendency of same-industry firms to conceal proprietary information from their competitors for competitive concerns. Such fears of losing business secrets ultimately discourages firms to develop collaborative ties with other companies that could be mutually beneficial. The presence of common owners would instead work as a "safety net" for those secrets.

The second scenario, which corresponds to the null hypothesis, is that of no statistically significant relationship between common ownership and competitiveness proxies. Several explanations may lie behind this case, as highlighted by He and Huang (2017): institutional investors in practice do not have any incentive to foster competition (for instance, because their ownership stake is the reflection of a passive investment strategy aimed at simply tracking a given benchmark) or they do not succeed in exerting enough influence via voce, voting or by implicitly exercising pressure on the cross-owned firms' management; the common-owner may also subtly act as a cartel-ringmaster (rather than

playing a bridge-building role), meaning that it does not enhance coordination but aims at keeping the current competitive landscape as it is in order not to potentially damage one or more of the common-held companies. In terms of operating profitability, a statistically insignificant relationship with cross-ownership might mean that the common holders tend not to exert influence on management to enhance efficiency or they do not succeed in doing that.

If there is a negative statistically significant relationship between common ownership and market share or between common ownership and operating profit margins (the third possible scenario), this might mean that common owners do not exert any form of oversight over the managerial conduct within the portfolio companies up to a point that they are disinterested in corporate governance and companies' strategies in such a way that non-common held firms can better address agency conflicts between shareholders and managers thus triggering for these last companies higher efficiency and market share growth.

To conclude, we remark that the two proxies analyzed for product market performance are market share growth and operating profitability.

# **Chapter 3: Empirical analysis**

#### **3.1. Sample selection**

The sample examined in this paper encompasses listed stocks included in the STOXX Europe 600, which is an index derived from the STOXX<sub>16</sub> Europe Total Market Index (TMI) and a subset of the STOXX Global 1800 Index. This index represents large, mid and small capitalization companies across 17 countries located in the European region<sub>17</sub> and is aimed at grasping the state of health of the European financial markets as a whole. Index weights are established on the basis of the free-float market capitalization of its components and the index composition is typically reviewed on a quarterly basis (March, June, September, December), when for each company deleted a new firm is added (changes are usually in the range between 5 and 10 corporations for each review) so that to preserve the total number of companies comprehended. We track the composition of the index on an annual basis, at the end of December, for the time window between 2001 and 2018 (18 years overall). In order to collect these pieces of information, we employed Bloomberg terminal and Thomson Reuters Datastream.

#### **3.2.** Market share growth measures

For each one of the 18 years under analysis, we identify all the companies traded on the 17 stock exchanges considered for the purpose of constructing the index, we classify them by SIC four-digit code and then cluster them according to Fama-French 12 industries (Business Equipment; Chemicals and Allied Products; Consumer Durables; Consumer

<sup>16</sup> STOXX is part of Deutsche Boerse Group.

<sup>&</sup>lt;sup>17</sup> The comprehensive list of these countries includes: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, the United Kingdom.

Non-Durables; Energy, Oil, Gas and Coal Extraction and Products; Finance; Healthcare, Medical Equipment and Drugs; Manufacturing; Shops, Wholesale, Retail and Services; Telephone and Television Transmission; Utilities; Other). We sum (on an industry basis) the revenues of all the companies for which data are available and in this way we define the market size for each industry and each year. These results are displayed in **TABLE 1**.

For each firm *i* belonging to STOXX Euro 600 (if data on annual revenues and SIC codes are available), product market share at time *t* is defined as:  $MarketShare_{i,t} = \frac{Company revenues_{i,t}}{Industry revenues_t}$ . In order to define market share growth, we use two measures, both

based on revenues from sales:

- 1) Market share growth<sub>i,t</sub> =  $\frac{Company revenues_{i,t}}{Industry revenues_t} \frac{Company revenues_{i,t-1}}{Industry revenues_{t-1}}$
- 2)  $LN(Market share growth_{i,t})$ =  $LN\left(1 + \frac{Company revenues_{i,t}}{Industry revenues_t}\right) - LN\left(1 + \frac{Company revenues_{i,t-1}}{Industry revenues_{t-1}}\right)$

#### 3.3. Cross-ownership measures

For each year in the 2001-2018 sample period, we extract ownership stakes (as of the last trading day of the solar year), investors' full name and investors' type description for the 10 main shareholders in each index component using Thomson Reuters Eikon. First of all, we filter data by excluding ownership percentages associated to non-institutional investors (individual investors, other insider investors, corporations, holding companies, government agencies, foundations, research firms, independent research firms). Thus, the types of investor whose ownership stakes are included in our analysis are the following: investment advisors, pension funds, hedge funds, private equity, venture capital, banks and trusts, sovereign wealth funds, insurance companies.

# TABLE 1

Market values for industries

(Data in €/million)	2001	2002	2003	2004	2005	2006	2007	2008	2009
BUSINESS EQUIPMENT	278,670	237,692	214,070	223,527	240,046	266,802	301,043	301,531	266,563
CHEMICALS AND ALLIED PRODUCTS	318,075	298,460	278,498	288,816	308,717	334,865	471,548	368,058	323,870
CONSUMER DURABLES	532,146	532,572	519,747	540,512	564,407	593,871	572,890	562,522	541,581
CONSUMER NON DURABLES	458,355	450,248	427,676	433,297	452,839	508,100	889,786	546,913	528,813
ENERGY, OIL, GAS AND COAL EXTRACTION AND PRODUCTS	768,982	769,044	770,139	907,579	1005,956	1144,148	1199,209	1444,847	916,061
FINANCE	2296,687	2114,264	2048,949	2133,993	2636,548	2847,255	3174,780	2579,283	2432,075
HEALTHCARE, MEDICAL EQUIPMENT AND DRUGS	291,888	295,225	275,274	267,947	290,845	307,968	319,002	317,486	328,799
MANUFACTURING	832,926	806,436	737,389	775,760	857,212	1013,480	1055,824	1121,584	919,045
OTHER	851,771	886,171	890,991	935,938	934,170	1059,914	1234,413	1272,396	1152,721
SHOPS WHOLESALE, RETAIL AND SERVICES	991,226	977,921	930,712	921,877	942,377	1007,059	1517,560	1090,974	998,581
TELEPHONE AND TELEVISION TRANSMISSION	402,106	409,135	404,802	400,632	437,277	440,947	478,609	484,321	455,668
UTILITIES	445,393	395,182	404,802	439,108	540,510	693,745	719,377	877,689	765,535
(Data in €/thousands)	2010	2011	2012	2013	2014	2015	2016	2017	2018
(Data in €/thousands) BUSINESS EQUIPMENT	<b>2010</b> 292,318	<b>2011</b> 299,759	<b>2012</b> 298,087	<b>2013</b> 277,588	<b>2014</b> 280,008	<b>2015</b> 304,009	<b>2016</b> 307,100	<b>2017</b> 316,735	<b>2018</b> 338,834
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS	<b>2010</b> 292,318 398,441	<b>2011</b> 299,759 435,712	<b>2012</b> 298,087 293,496	<b>2013</b> 277,588 466,635	<b>2014</b> 280,008 464,750	<b>2015</b> 304,009 478,780	<b>2016</b> 307,100 459,426	<b>2017</b> 316,735 478,495	<b>2018</b> 338,834 455,630
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS CONSUMER DURABLES	<b>2010</b> 292,318 398,441 638,661	<b>2011</b> 299,759 435,712 760,188	2012 298,087 293,496 844,013	<b>2013</b> 277,588 466,635 852,696	<b>2014</b> 280,008 464,750 988,415	<b>2015</b> 304,009 478,780 1097,495	<b>2016</b> 307,100 459,426 1132,019	<b>2017</b> 316,735 478,495 1208,889	<b>2018</b> 338,834 455,630 1205,251
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS CONSUMER DURABLES CONSUMER NON DURABLES	2010 292,318 398,441 638,661 541,418	2011 299,759 435,712 760,188 557,020	2012 298,087 293,496 844,013 164,648	<b>2013</b> 277,588 466,635 852,696 596,250	<b>2014</b> 280,008 464,750 988,415 602,660	<b>2015</b> 304,009 478,780 1097,495 629,891	<b>2016</b> 307,100 459,426 1132,019 638,568	<b>2017</b> 316,735 478,495 1208,889 668,010	<b>2018</b> 338,834 455,630 1205,251 664,537
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS CONSUMER DURABLES CONSUMER NON DURABLES ENERGY, OIL, GAS AND COAL EXTRACTION AND PRODUCTS	2010 292,318 398,441 638,661 541,418 1333,728	2011 299,759 435,712 760,188 557,020 1711,024	2012 298,087 293,496 844,013 164,648 1918,030	<b>2013</b> 277,588 466,635 852,696 596,250 1871,067	2014 280,008 464,750 988,415 602,660 1786,954	<b>2015</b> 304,009 478,780 1097,495 629,891 1359,903	<b>2016</b> 307,100 459,426 1132,019 638,568 1184,940	2017 316,735 478,495 1208,889 668,010 1434,776	<b>2018</b> 338,834 455,630 1205,251 664,537 1661,133
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS CONSUMER DURABLES CONSUMER NON DURABLES ENERGY, OIL, GAS AND COAL EXTRACTION AND PRODUCTS FINANCE	2010 292,318 398,441 638,661 541,418 1333,728 2474,206	2011 299,759 435,712 760,188 557,020 1711,024 2380,783	2012 298,087 293,496 844,013 164,648 1918,030 2558,465	<b>2013</b> 277,588 466,635 852,696 596,250 1871,067 2492,542	2014 280,008 464,750 988,415 602,660 1786,954 2587,005	2015 304,009 478,780 1097,495 629,891 1359,903 2421,729	<b>2016</b> 307,100 459,426 1132,019 638,568 1184,940 2599,614	2017 316,735 478,495 1208,889 668,010 1434,776 2528,499	<b>2018</b> 338,834 455,630 1205,251 664,537 1661,133 2081,458
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS CONSUMER DURABLES CONSUMER NON DURABLES ENERGY, OIL, GAS AND COAL EXTRACTION AND PRODUCTS FINANCE HEALTHCARE, MEDICAL EQUIPMENT AND DRUGS	2010 292,318 398,441 638,661 541,418 1333,728 2474,206 371,448	2011 299,759 435,712 760,188 557,020 1711,024 2380,783 376,576	2012 298,087 293,496 844,013 164,648 1918,030 2558,465 395,421	2013 277,588 466,635 852,696 596,250 1871,067 2492,542 390,172	2014 280,008 464,750 988,415 602,660 1786,954 2587,005 397,168	2015 304,009 478,780 1097,495 629,891 1359,903 2421,729 440,424	2016 307,100 459,426 1132,019 638,568 1184,940 2599,614 463,537	2017 316,735 478,495 1208,889 668,010 1434,776 2528,499 450,974	<b>2018</b> 338,834 455,630 1205,251 664,537 1661,133 2081,458 464,495
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS CONSUMER DURABLES CONSUMER NON DURABLES ENERGY, OIL, GAS AND COAL EXTRACTION AND PRODUCTS FINANCE HEALTHCARE, MEDICAL EQUIPMENT AND DRUGS MANUFACTURING	2010 292,318 398,441 638,661 541,418 1333,728 2474,206 371,448 1069,256	2011 299,759 435,712 760,188 557,020 1711,024 2380,783 376,576 1205,857	2012 298,087 293,496 844,013 164,648 1918,030 2558,465 395,421 1237,846	2013 277,588 466,635 852,696 596,250 1871,067 2492,542 390,172 1186,442	2014 280,008 464,750 988,415 602,660 1786,954 2587,005 397,168 1174,477	<b>2015</b> 304,009 478,780 1097,495 629,891 1359,903 2421,729 440,424 1187,553	2016 307,100 459,426 1132,019 638,568 1184,940 2599,614 463,537 1173,022	<b>2017</b> 316,735 478,495 1208,889 668,010 1434,776 2528,499 450,974 1272,139	2018 338,834 455,630 1205,251 664,537 1661,133 2081,458 464,495 1311,667
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS CONSUMER DURABLES CONSUMER NON DURABLES ENERGY, OIL, GAS AND COAL EXTRACTION AND PRODUCTS FINANCE HEALTHCARE, MEDICAL EQUIPMENT AND DRUGS MANUFACTURING OTHER	2010 292,318 398,441 638,661 541,418 1333,728 2474,206 371,448 1069,256 1277,623	2011 299,759 435,712 760,188 557,020 1711,024 2380,783 376,576 1205,857 1358,277	2012 298,087 293,496 844,013 164,648 1918,030 2558,465 395,421 1237,846 1444,725	2013 277,588 466,635 852,696 596,250 1871,067 2492,542 390,172 1186,442 1378,910	2014 280,008 464,750 988,415 602,660 1786,954 2587,005 397,168 1174,477 1438,220	<b>2015</b> 304,009 478,780 1097,495 629,891 1359,903 2421,729 440,424 1187,553 1493,653	2016 307,100 459,426 1132,019 638,568 1184,940 2599,614 463,537 1173,022 1445,395	<b>2017</b> 316,735 478,495 1208,889 668,010 1434,776 2528,499 450,974 1272,139 1523,988	2018 338,834 455,630 1205,251 664,537 1661,133 2081,458 464,495 1311,667 1603,703
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS CONSUMER DURABLES CONSUMER NON DURABLES ENERGY, OIL, GAS AND COAL EXTRACTION AND PRODUCTS FINANCE HEALTHCARE, MEDICAL EQUIPMENT AND DRUGS MANUFACTURING OTHER SHOPS WHOLESALE, RETAIL AND SERVICES	2010 292,318 398,441 638,661 541,418 1333,728 2474,206 371,448 1069,256 1277,623 1101,819	2011 299,759 435,712 760,188 557,020 1711,024 2380,783 376,576 1205,857 1358,277 1131,321	2012 298,087 293,496 844,013 164,648 1918,030 2558,465 395,421 1237,846 1444,725 640,047	2013 277,588 466,635 852,696 596,250 1871,067 2492,542 390,172 1186,442 1378,910 1234,839	2014 280,008 464,750 988,415 602,660 1786,954 2587,005 397,168 1174,477 1438,220 1292,408	2015 304,009 478,780 1097,495 629,891 1359,903 2421,729 440,424 1187,553 1493,653 1331,383	2016 307,100 459,426 1132,019 638,568 1184,940 2599,614 463,537 1173,022 1445,395 1248,857	2017 316,735 478,495 1208,889 668,010 1434,776 2528,499 450,974 1272,139 1523,988 1310,542	2018 338,834 455,630 1205,251 664,537 1661,133 2081,458 464,495 1311,667 1603,703 1311,840
(Data in €/thousands) BUSINESS EQUIPMENT CHEMICALS AND ALLIED PRODUCTS CONSUMER DURABLES CONSUMER NON DURABLES ENERGY, OIL, GAS AND COAL EXTRACTION AND PRODUCTS FINANCE HEALTHCARE, MEDICAL EQUIPMENT AND DRUGS MANUFACTURING OTHER SHOPS WHOLESALE, RETAIL AND SERVICES TELEPHONE AND TELEVISION TRANSMISSION	2010 292,318 398,441 638,661 541,418 1333,728 2474,206 371,448 1069,256 1277,623 1101,819 493,355	2011 299,759 435,712 760,188 557,020 1711,024 2380,783 376,576 1205,857 1358,277 1131,321 497,880	2012 298,087 293,496 844,013 164,648 1918,030 2558,465 395,421 1237,846 1444,725 640,047 528,622	2013 277,588 466,635 852,696 596,250 1871,067 2492,542 390,172 1186,442 1378,910 1234,839 496,877	2014 280,008 464,750 988,415 602,660 1786,954 2587,005 397,168 1174,477 1438,220 1292,408 483,973	2015 304,009 478,780 1097,495 629,891 1359,903 2421,729 440,424 1187,553 1493,653 1331,383 502,219	2016 307,100 459,426 1132,019 638,568 1184,940 2599,614 463,537 1173,022 1445,395 1248,857 511,072	2017 316,735 478,495 1208,889 668,010 1434,776 2528,499 450,974 1272,139 1523,988 1310,542 505,426	2018 338,834 455,630 1205,251 664,537 1661,133 2081,458 464,495 1311,667 1603,703 1311,840 469,792

The table reports the market values (in  $\notin$ /millions) for Fama-French 12 industries in Europe for the years between 2001 and 2008. The selection process employed is the following: we identify all listed companies in the 17 European countries that represent the basis of Euro STOXX 600 for each one of the 18 years under analysis, we collect their revenues at year-end and cluster them by industry, starting from their SIC code.

We define a block if an ownership stake exceeds 5%, but we also employ the alternative threshold 3% for robustness purposes. We first define a block dummy for single investors in each company, which is equal to 1 if the shareholder holds a block and 0 otherwise. Then, we define a block-held firm dummy, which is equal to 1 if at least one institutional investor holds a block in the company and 0 otherwise.

In order to track cross-ownership on a quantitative basis, we cluster STOXX Euro 600 companies within Fama-French 12 industries and we define a cross-held (and contemporaneously block-held) individual dummy variable for each of the 10 main investors for each firm in each industry. Such variable is equal to 1 if an investor owns at least two blocks in an industry (the essence of cross-ownership) and 0 otherwise. For each firm, we have 10 of these binary variables and they are summarized at firm level by means of a cross-held (and block-held) company dummy variable which is equal to 1 if there is at least one cross-holder in the ownership structure of the company and 0 otherwise. For the sake of completeness, we define also: a block-held (but not cross-held) company dummy, which is equal to 1 if there is at least a block in a firm without the block-holder being a cross-holder and 0 otherwise; a non-block-held (and non-cross-held) company dummy, which is equal to 1 if there are only investors not holding blocks in a firm, i.e. if the company has a widely dispersed ownership base, and 0 otherwise. The sum of these three variables, given that they encompass each and every possible scenario, must be always equal to 1.

The second measure, <u>NumConnected</u> (number of rival firms with common institutional block-holders), is constructed by first computing, for each investor in each company, how many times such investor appears as a block-holder in other companies in the same

industry within the sample in a particular year. Once we have 10 numbers for each company (corresponding to the main 10 investors), NumConnected will just be the sum of them.

The third measure, <u>NumCross</u> (number of unique institutions that cross-hold the company), is equal to the sum of the 10 cross-held (block-held) individual dummies for each corporation.

The fourth measure, <u>AvgNum</u> (number of same industry peers block-held by the average cross-holding institutional investor) is calculated as nothing more than the ratio of the second measure over the third one.

The fifth measure, <u>TotalCrossOwn</u>, is the sum of the cross-block percentages controlled by institutional investors in each firm.

We control for a vector of company characteristics that may affect a firm's future market share growth and operating profitability. As supported by He and Huang (2017), firms in the early stage of their life-cycle, meaning with smaller size (proxied by total assets and its logarithm), more growth opportunities (captured by Tobin's Q, computed as market value of equity over book value of equity), larger growth in fixed assets (measured by the percentage change in property, plant and equipment) and higher return on assets are more likely to experience faster market share growth and higher operating profit margins.

Additionally, companies with more aggressive investment strategies, meaning with larger capital expenditures, larger acquisition expenditures and more research and development expenses (all scaled by total assets) should enjoy a faster market share growth. We also control for a firm cash holdings and leverage ratio (long-term debt over total assets).

## 3.4. Historical evolution of cross-ownership

FIGURE 2a-2d provide an intuitive depiction of the expansion of cross-ownership (and also block-ownership) in the time window between 2001 and 2018, both at institutional investors-level and all investors-level as well as for 5% and 3% ownership thresholds for blocks.

If we first focus on institutional investors only, the fraction of sample companies in which at least one institutional investor holds a 5% stake (steadily) grew by 18.08% from 48.42% to 66.50% in 17 years and the level of firms with at least one cross-block-institution in its shareholder structure underwent a (gradual) 22.25% increase from 30.88% to 53.13% in the same period. This piece of evidence is similar to the pattern found by Backus et al. (2019) in the US. Contemporaneously, firms block-held but not cross-held (progressively) declined by 4.17% from 17.54% to 13.37% and non-block held and non-cross held corporations shrank by 14.75% from 48.25% to 33.50%. The only cases in which changes are larger than 5% on a yearly basis are related to the block-held firm dummy (a 7.07% expansion between 2006 and 2007, to which an exactly specular reduction in non-block held and non-cross held firms can be referred) and to the cross-held (and block-held) firm dummy, with a steep enlargement in 2007, 2009 and 2015.

The changes described above turn out to be magnified further if we adopt the 3% block minimum percentage. The number of block-held companies undeviatingly widened from 64.39% to 86.80% (22.43% increase) from 2001 to 2018 and the block-held (and at the same time cross-held) companies expanded from 49.30% to 80.03% (+30.73%) in such a time span. Block-held but non-cross-held enterprises diminished by 8.32% (from 15.09% to 6.77%) and non-block-held and non-cross-held companies dropped by 19.08% (from



The figures 2a-2d depict the evolution of block ownership percentage and three metrics related to cross-ownership: crossheld (and at the same time block-held) firms; non-cross-held (but block-held) firms; non-cross-held and non-block held companies.

FIGURE 2b: INSTITUTIONAL INVESTORS ONLY (3% OWNERSHIP THRESHOLD)





5% 0% 

Year

FIGURE 2c: ALL INVESTORS (5% OWNERSHIP THRESHOLD)

32.28% to 13.20%). A significant fluctuation can be noticed in terms of block-held companies (+5.86% in 2007, coupled with an identical decrease in the number of non-block-held and non-cross held companies). In the same year, the level of cross-held and at the same time block-held firms grew by 8.45%, while another relevant jump in the same variable can be noticed between 2001 and 2002 (+5.61%).

If we broaden our perspective to include all investors instead of institutional investors only, we may get a more comprehensive view on the phenomenon. By setting 5% as the minimum threshold for defining a block, the level of block-held companies heightened by 18.48% from 75.09% to 93.57% and the number of firms contemporaneously block-held and cross-held strengthened by 23.93 percentage points from 35.96% to 59.90%. As in the previous cases, we can observe here gradual reductions in the remaining two variables. In particular, the level of companies block-held but non-cross-held shifted downwards by 5.45%, from 39.12% to 33.67%. Meanwhile, the amount of sample firms that are neither block-held nor cross-held diminished from 21.58% to 6.43% (-15.15%). The most significant year-on-year change is a 6.03% increase in the level of cross-block-held corporations in 2007, while the other variable always underwent yearly changes below 5%.

The adoption of a 3% threshold results in even more polarized figures, with a gradual upward movement in the number of block-held enterprises (from 85.96% to 98.82%, with an overall increase equal to 12.85%), a rise of block-held (and cross-held) companies by 28.65% (from 55.61% to 84.26%), an almost specular downward shift of block-held but non-cross-held corporations (-15.80%, from 30.35% to 14.55%) and a convergence towards 0 in the number of non-block-held and non-cross-held firms (in 2018 they

represented only 1.18% of the sample companies, down by 9.52% from the 10.70% figure that dates back to 2001).

#### **3.5.** Summary statistics

In order to minimize the effects of outliers, we apply winsorization to all continuous variables at the 1<sub>st</sub> and 99<sub>th</sub> percentiles. **TABLE 2** provides summary statistics for the unbalanced panel we construct.

#### 3.5.1. Cross-ownership measures

The six rows of **TABLE 2** report measures for the extent of block-ownership and crossownership. Almost 62% of the observations correspond to companies that have at least one institutional shareholder holding a block of 5% or more. Slightly more than 43% of the firm-year observations are marked by a cross-holding by at least one institution, meaning that at least one institution owns a 5% block at the same time in the company and in another firm belonging to the same Fama-French industry (in He and Huang analysis the mean CrossDummy is non substantially different and it equals 0.415). The average number of connected firms (meaning with one or more common shareholders) is equal to approximately 2.79 (in the reference paper this statistics is equal to 2.285), with the median and the 75% percentile being equal to 0 and 3 companies respectively. However, if we exclude the observations for which there is no cross-ownership (thus NumConnected is equal to 0), the average number of connected companies shifts to 6.58 and the median number of connected firms jumps from 0 to 4. The average level of crossholding institutional investors corresponds to 0.71 (according to He and Huang analysis it is 0.60) but if we remove the non-cross-held companies the average number of crossholders is equal to 1.65 while the median is 1. The mean of the number of same-industry peers block-held by the average cross-holding institution is equal to 1.70 (1.04 in He and Huang study) but if we exclusively consider the firm-year observations for which AvgNum is different from 0, the mean of this variable becomes equal to slightly more than 4 whereas the median turns out to be equal to 2.5. TotalCrossOwn is, on average, equal to 5.71% (for He and Huang it is 6.4%) but, again, once we exclude non cross-held firms, the statistics is equal to 13.2% and the median is 10.2%.

If we use the alternative definition for a block (at least 3% ownership stake), summary statistics for cross-ownership figures are obviously generally higher in terms of averages and they are depicted in **TABLE 3**. Firm-year observations are block-held in 79.4% of the cases, more than 2 firms out of 3 are on average cross-owned, the average firm has almost 14 companies to which it is connected by means of cross-institutional-investors, the cross-owning institutions are on average 2 and the total percentage of ownership attributable to cross-owners is 11.4% (the median being 6.6%).

For a matter of comparison and robustness purposes, **TABLE 3** also synthesizes the summary statistics for ownership measures once we consider all investors (and not exclusively institutional investors) as potential block-holders while computing cross-ownership measures, both when the minimum threshold for a block is set equal to 5% and 3%. If a 5% minimum threshold for defining a block is set, 88.2% of the firm-year observations are block-held, almost 50% of the companies are cross-held, with approximately 3 companies being the average number of firms composing the network structure by means of common investors. The median number of cross-holding investors in the sample corresponds to 0.8 (meaning that 4 companies out of 5 show a cross-holder within their ownership structure) and the total percentage of ownership in the hands of

cross-holders amounts to 8.35%. If we exclude from the analysis those observations that are related to non-cross-held companies, as practically done in **TABLE 4**, NumConnected has mean of 5.97 (median=3), NumCross is on average 1.60, AvgNum has a mean of 3.63 (median equal to 2) and the overall ownership stake attributable to cross-holders is on average 16% (with a median of 11.5%).

In case of a 3% minimum percentage stake for a block, 95.2% of firm-year observations correspond to block-held firms, in more than two thirds of the cases companies are cross-held, 14 companies turn out to be connected on average by means of a cross-ownership network, the average number of same-industry competitors in which the average block-investor holds a stake is equal to 4.54 and the total stake of cross-block-holders is slightly more than 14% (by excluding the approximately 17% of observations for which there is no cross-ownership, the average number of connected firms is 19.4 and the median is 11, NumCross has an average equal to 2.91 and a median of 2, AvgNum is on average equal to 6.21 and has a median corresponding to 4.25, the overall ownership stake controlled by cross-holders is equal to 19.4% on average and 14.7% in median).

The same exercise of investigating summary statistics for cross-ownership measures when only cross-held companies are taken into consideration is run for the case in which cross-ownership by institutional investors is exclusively analyzed, and results are again depicted in **TABLE 4**. If the block threshold is 5%, more than 6 companies are connected on average (4 according to the median) via cross-ownership links, the average firm-year observation has more than 1 cross-holding institution and AvgNum is larger than 4. The overall ownership stake to be attributed to cross-owners (once we eliminate observations for which BlockDummy is 0) is on average equal to 13%. For the 3% threshold, each of

	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
BlockDummy	0.61847	0.00000	1.00000	1.00000	0.48579	-0.48776	1.23791	9779
CrossDummy	0.43215	0.00000	0.00000	1.00000	0.49540	0.27393	1.07504	9779
NumConnected	2.78894	0.00000	0.00000	3.00000	5.91476	3.62195	19.11461	9779
NumCross	0.71429	0.00000	0.00000	1.00000	1.03812	1.90371	8.31408	9779
AvgNum	1.70230	0.00000	0.00000	2.00000	3.67239	4.83461	35.92358	9779
TotalCrossOwn	0.05712	0.00000	0.00000	0.09078	0.09087	2.46494	12.49903	9780

**TABLE 2:** Summary Statistics for cross-ownership measures

The table reports summary statistics based on the sampled European listed companies from 2001 to 2018 for block-ownership and cross-ownership measures. BlockDummy is a dummy variable that equals one if, in a company's ownership structure, there is at least one institutional investors holding a stake of at least 5% in a given period, and zero otherwise. CrossDummy is a dummy variable equal to 1 if, in a given period, an institutional investor owning a 5% (or more) block in a company also holds a block in another company belonging to the same industry, and zero otherwise. NumConnected is the number of same-industry rivals showing at least one common institutional block-holder at the end of the year. NumCross is the number of unique institutional investors that cross-hold a company at year-end. AvgNum is the average number of competitors cross-held by the average cross-holding institution at the end of the year. TotalCrossOwn is the total ownership percentage that can be attributed to cross-block-holders of a company in a given year.

	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
BlockDummy	0.79376	1.00000	1.00000	1.00000	0.40462	-1.45211	3.10861	9780
CrossDummy	0.67566	0.00000	1.00000	1.00000	0.46815	-0.75050	1.56325	9780
NumConnected	13.98926	0.00000	4.00000	19.00000	20.78276	1.99688	6.96507	9780
NumCross	2.02004	0.00000	1.00000	3.00000	2.22003	1.21814	3.87166	9780
AvgNum	4.52950	0.00000	2.33333	6.33333	6.45184	3.07619	17.86961	9780
TotalCrossOwn	0.11400	0.00000	0.06594	0.17809	0.13663	2.18412	16.07077	9780

TABLE 3 (1/3): Summary Statistics (3% threshold – Institutional Investors only)

	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
BlockDummy	0.88220	1.00000	1.00000	1.00000	0.32239	-2.37113	6.62225	9779
CrossDummy	0.49893	0.00000	1.00000	1.00000	0.50004	0.00429	1.00001	9779
NumConnected	2.93005	0.00000	0.00000	3.00000	5.90553	3.59019	18.93094	9779
NumCross	0.80233	0.00000	1.00000	1.00000	1.03225	1.61971	6.67420	9779
AvgNum	1.78136	0.00000	0.00000	2.00000	3.61912	4.89199	36.88517	9779
TotalCrossOwn	0.08349	0.00000	0.00000	0.11471	0.13392	2.66454	12.16121	9779
TABLE 3 (3/3): Summar	y Statistics (3%)	threshold – A	ll Investors)					
	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
BlockDummy	0.95184	1.00000	1.00000	1.00000	0.21411	-4.22077	6.62225	9780
CrossDummy	0.73252	0.00000	1.00000	1.00000	0.44267	-1.05057	1.00001	9780
NumConnected	14.22853	0.00000	5.00000	19.00000	20.78054	1.98857	18.93094	9780
NumCross	2.13405	0.00000	1.00000	3.00000	2.18814	1.18970	6.67420	9780
AvgNum	4.53897	0.00000	2.50000	6.22500	6.28020	3.17467	36.88517	9780
TotalCrossOwn	0.14193	0.00000	0.09322	0.21895	0.15982	1.68986	12.31411	9780

TABLE 3 (2/3): Summary Statistics (5% threshold – All Investors)

The table reports summary statistics based on the sampled European listed companies from 2001 to 2018 for block-ownership and cross-ownership measures. While the variables are the same of the previous table, we use different criteria in order to compute them: only institutional investors with a minimum threshold for defining a block equal to 3%, institutional and non-institutional investors with a minimum threshold for defining a block equal to 5% and 3%.

# TABLE 4 (1/4): Summary Statistics (cross-held firms only; institutional investors only; 5% threshold for a block)

	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
NumConnected	6.57815	2.00000	4.00000	8.00000	7.58917	2.48995	10.08223	4146
NumCross	1.65286	1.00000	1.00000	2.00000	0.97079	2.10672	10.14732	4226
AvgNum	4.01999	1.33333	2.50000	5.00000	4.74694	3.76891	21.52535	4141
TotalCrossOwn	0.13218	0.05980	0.10248	0.17054	0.09586	2.30934	11.91280	4226

TABLE 4 (2/4): Summary Statistics (cross-held firms only; institutional investors only; 3% threshold for a block)

							/	
	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
NumConnected	20.82420	4.00000	4.00000	12.00000	22.37482	1.55669	5.17259	6570
NumCross	2.98926	1.00000	1.00000	2.00000	2.09665	1.08358	3.45705	6609
AvgNum	6.74768	2.33333	2.50000	4.75000	6.85890	2.95145	16.29377	6565
TotalCrossOwn	0.16870	0.06328	0.10275	0.12980	0.13563	2.31334	19.51501	6609

TABLE 4 (3/4): Summary Statistics (cross-held firms only; all investors; 5% threshold for a block)

	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
NumConnected	5.97456	1.00000	3.00000	7.00000	7.27580	2.65500	11.20721	4795
NumCross	1.60804	1.00000	1.00000	2.00000	0.91650	1.99644	8.68801	4878
AvgNum	3.63242	1.00000	2.00000	4.00000	4.47098	4.04511	24.51987	4795
TotalCrossOwn	0.16736	0.06344	0.11505	0.20640	0.14806	2.25285	9.08934	4878

### TABLE 4 (4/4): Summary Statistics (cross-held firms only; all investors; 3% threshold for a block)

	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
NumConnected	19.49496	3.00000	11.00000	28.00000	22.11344	1.63174	5.43394	7138
NumCross	2.91332	1.00000	2.00000	4.00000	2.06542	1.14846	3.63765	7164
AvgNum	6.21986	2.00000	4.25000	8.00000	6.60247	3.08414	17.72403	7137
TotalCrossOwn	0.19376	0.07310	0.14728	0.27216	0.15758	1.65182	7.36765	7164

The table reports summary statistics based on the sampled European listed companies from 2001 to 2018 for cross-ownership measures, taking into consideration only those firm-year observations for which the variable CrossDummy is equal to one. Four scenarios are depicted for robustness purposes: institutional investor only, with a minimum threshold for defining a block equal to 5%; institutional investors only, with a minimum percentage for defining a block equal to 5%; institutional and non-institutional investors, with a minimum percentage for defining a block equal to 3%; institutional and non-institutional investors, with a minimum percentage for defining a block equal to 3%.

these statistics is larger and, in particular, TotalCrossOwn corresponds to 16.9% on average (but the median is negligibly shifted upwards).

Overall, institutional cross-ownership is a relevant phenomenon for at least 2 firm-year observations out of 5 if a block is set with a minimum threshold of 5% (2 out of 3 if the threshold is 3%). This reflects in the width of the network structures created by means of cross-ownership: less than 3 companies are on average common-held by an institution with 5% blocks while this network is expanded to almost 14 companies when we adopt 3% blocks. Thus, cross-ownership substantially changes figures when we move from the 3% to the 5% threshold in Europe.

Besides, cross-ownership statistics related to institutional cross-ownership are not substantially lower than those regarding every type of investor. On the one hand, there are approximately 15% of observations in the sample corresponding to companies that are block-held by non-institutional investors and at the same time they are not block-held by institutional investors. However, cross-ownership measures turn out to be only scarcely higher when we do not filter for institutional investors, which means that non-institutional investors do not tend to diversify in a significant way within one industry (and their blocks tend to be larger than those of institutional investors).

Finally, from a quantitative point of view, the sample companies' ownership structure is not widely affected by cross-ownership links, as the total percentage of ownership in a firm attributable to horizontal shareholders never exceeds (when we look at medians) 15 percentage points.

#### 3.5.2. Competition measures

The first 5 rows of **TABLE 5** report the summary statistics for market share growth measures and operating profit margin in the firm-years sample. Concerning the former, the discussion can be split into market share evolution between year t (year in which, at the end of December, a company is a component of EUROSTOXX 600) and year t+1 on the one hand and market share growth between year t and year t+3 on the other hand.

In the first case, which obviously is marked by a larger number of observations, the average (as well as median) market share growth is close to 0, which can easily be justified by the fact that market share changes are essentially a zero-sum game (in case there is no entry or exit in the market). This result is also consistent with He and Huang (2017), where the average market share growth between year t and year t+1 is equal to 0.002 and the median is exactly 0. What is relevant, however, is the particularly low variability of such variable, as indicated by the standard deviation of 0.00829 (and 0.00723 when the logarithmic formula is employed). The two measures have substantially equal statistics, even though by using the logarithm both skewness and kurtosis are partially reduced.

In the second case (3-years ahead), the average market share growth is still close to 0 but shows a slightly higher variability, with kurtosis being reduced with respect to the 1-year ahead measures. Again, statistics for the market share growth and the logarithmic market share growth are almost identical.

The 1-year ahead operating profit margin has a mean of 6.69% and a median equal to 11.4%, with also a considerable variation in the variable. Kurtosis is significantly high.

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	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
MktShareGrowt+1	-4.36e-06	-0.00030	0.00003	0.00046	0.00829	-0.70439	623.02870	9664
LnMktShareGrowt+1	2.25e-06	-0.00030	0.00003	0.00045	0.00723	-0.53515	419.75740	9664
MktShareGrowt+3	-0.00018	-0.00073	0.00004	0.00086	0.01044	-0.66918	325.61950	8158
LnMktShareGrowt+3	-0.00016	-0.00073	0.00004	0.00085	0.01021	-0.53610	215.24670	8158
OperProfitMargint+1	0.06689	0.05880	0.11425	0.19160	18.52848	-98.66947	9768.56532	9838
Assets	63.60454	3.07760	7.76412	28.93539	207.00110	6.21407	50.04078	9865
LnAssets	2.34111	1.12415	2.04951	3.36507	1.71837	0.66253	3.24548	9865
Tobinq	1.69568	1.20000	1.99000	3.30000	104.27931	-87.51422	8199.93304	9855
CashAssets	0.11482	0.04169	0.08156	0.14542	0.11618	2.85702	16.03168	8358
Leverage	0.20669	0.09121	0.18469	0.28865	0.16011	2.43233	23.34372	9463
ROA	0.06644	0.02750	0.05710	0.08922	0.07732	11.55034	309.78941	9236
R&DCapital	0.01316	0.00000	0.00000	0.01128	0.03120	4.28070	30.06500	9893
CapexAssets	0.04103	0.01202	0.03208	0.05664	0.04088	2.45943	15.31445	9634
AcqAssets	0.03487	0.00199	0.00979	0.03671	0.06751	5.13335	57.41841	5575
PPEGrowtht	0.14462	-0.04728	0.02821	0.12404	2.81426	51.87112	2983.66602	9799
PPEGrowtht+1	0.24515	-0.05814	0.02091	0.10929	15.54136	96.21412	9418.53374	9816

TABLE 5: Summary Statistics for product market performance proxies and control variables

This table reports summary statistics based on the sampled European listed companies from 2001 to 2018. MktShareGrowt+1 is the difference between a firm's market share in the current year. LnMktShareGrowt+1 is the difference between the logarithm of one plus the company's market share next year and the logarithm of one plus the firm's market share in the current year. MktShareGrowt+3 is the difference between a firm's market share in three year time and in the current year. LnMktShareGrowt+3 is the difference between the logarithm of one plus the company's market share in three year time and the logarithm of one plus the company's market share in three year time and the logarithm of one plus the company's market share in the current year. OperProfitMargint+1 is the operating profit margin reported in the next year. Assets is the amount of total assets of the sampled companies in the current year. LnAssets is the natural logarithm of the assets of sampled companies in the next year. Tobing is the ratio of the market value of equity over the book value of equity in the current year. CashAssets is the ratio of cash and cash equivalents to company's total assets in the current year. CapexAssets is the ratio of capital is the ratio of research and development expenses over total assets in the current year. PPEGrowtht is the growth in property, plant and equipment between the last period and the current period. PPEGrowtht+1 is the growth in property, plant and equipment between the last period and the current period.

#### 3.5.3. Control variables

The rows from 6 to 16 of **TABLE 5** summarize key statistics for our control variables. For example, the average company in our sample has a Tobin's Q of 1.696, a leverage ratio of 20.67%, a ROA of 6.64%, capital expenditures corresponding to 4.1% of its total assets, a growth in property, plant and equipment equal to 14.5% in year t and 24.5% in year t+1 (but median values remarkably reduce such a gap, as well as the values for the other variables with the only exception of Tobin's Q).

#### 3.5.4. Characteristics of cross-held and non-cross-held firms

**TABLE 6** provides the systematic continuation of the discussion about the dichotomy between cross-held and non-cross-held companies. While we previously considered the discussion from the viewpoint of cross-ownership measures, we now focus on the differences in terms of market power and fundamentals. In order to formulate a statistically-backed reasoning, we utilize a two-sample t-test for the difference between means and a nonparametric test for the difference between medians. What can be deducted is that, on average and in median terms, cross-held firms do not show a higher market share growth (both in 1 and 3 years) and a significantly higher operating profit margin than non-cross-held firms. Cross-held corporations do have smaller total assets, higher Tobin's Q, lower cash over assets, higher leverage and ROA, lower capital expenditures/assets and higher acquisition assets/total assets. We do not register significant differences in terms of research and development expenses compared to assets as well as in terms of growth in fixed assets (property, plant and equipment) in year t and year t+1 (only one coefficient is negative and significant but at 10% level).

	Cross-he	eld firm	Non-cross-	-held firm				
Variable	Mean (1)	Median (2)	Mean (3)	Median (4)	Difference (1)-(3)		Difference (2)-(4)	
MktShareGrow <sub>t+1</sub>	-0.000078	0.000029	0.000064	0.000036	-0.000142		-0.000007	
LnMktShareGrowt+1	-0.000071	0.000028	0.000070	0.000036	-0.000140		-0.000008	
MktShareGrowt+3	-0.000151	0.000039	-0.000199	0.000043	0.000050		-0.000004	
LnMktShareGrowt+3	-0.000136	0.000039	-0.000161	0.000042	0.000026		-0.000003	
OperProfitMargint+1	0.139234	0.122400	-0.227025	0.108200	0.366322		0.014200	*
Assets	45.644541	5.339700	77.243250	10.873960	-31.598470	***	-5.534260	***
LnAssets	1.953966	1.675169	2.625620	2.386371	-0.671576	***	-0.711202	***
Tobinq	0.477023	2.160000	2.619840	1.910000	-2.141948		0.250000	***
CashAssets	0.112201	0.079320	0.116471	0.084294	-0.004489	*	-0.004974	**
Leverage	0.225229	0.203710	0.193377	0.173021	0.031891	***	0.030689	***
ROA	0.074752	0.063300	0.060464	0.052300	0.014269	***	0.011000	***
R&DCapital	0.014189	0.000000	0.012547	0.000000	0.001641	***	0.000000	
CapexAssets	0.039053	0.030004	0.042376	0.033650	-0.003327	***	-0.003646	***
AcqAssets	0.038585	0.012536	0.031573	0.008146	0.007089	***	0.004390	***
PPEGrowth	0.124533	0.028197	0.160219	0.028564	-0.034821		-0.000367	
PPEGrowth <sub>t+1</sub>	0.411174	0.019489	0.125677	0.022581	0.285468		-0.003092	*
BlockDummy	0.000000	1.000000	0.328111	0.000000	0.671830	***	1.000000	***

# TABLE 6Characteristics of cross-held and non-cross-held firm

The table reports the characteristics of cross-held and non-cross-held companies in the sample in terms of mean and median values as well as the differences between these values. \*\*\*, \*\* and \* indicate that a two-sample t-test for the difference between means or a nonparametric median test is significant at the 1%, 5% and 10% levels, respectively.

3.5.5. Distribution of cross-held and non-cross held firms across Fama-French 12 industries

In order to unveil whether cross-ownership particularly nests in one or several industries, thus originating potential concerns from a competitive point of view, we employ **TABLE** 7 to develop a Fama-French 12 industry-based breakdown of firm-years observations, dividing them in cross-held and non-cross-held (and in this case we further distinguish between block-held and non-block-held corporations). This analysis is run for institutional investors only as well as for all investors and for both the 5% and 3% block percentages.

Focusing on cross-ownership by institutional investors at 5% minimum stake for blocks, at least 11 companies out of 100 are cross-held in each and every industry, but with a substantial variability among these business sectors. The statistic is the lowest for Consumer Durables (11.68%) while it reaches its peak in the fields of Manufacturing (50.87%), Business Equipment (51.83%), Shops Wholesale, Retail and Services (58.23%). Among non-cross-held companies, the most likely to be block-held are those belonging to Consumer Durables and Energy. Concerning the remaining sectors, block-held (but non-cross-held) companies always lay in a range between 15.50% (Other) and 21.52% (Chemicals and Allied Products). The fraction of companies that are neither block-held nor cross-held always represent a substantial number of all the sample companies and they fluctuate in a range between 25.81% (Shops Wholesale, Retail and Services) and 52.70% (Utilities).

Fraction of firm-years across industries							
5% threshold for defining a block		Non-cro	ss-held				
Fama-French 12 Industry	Cross-held	Block-held	Non-Block-held				
Business Equipment	51.83%	18.15%	30.02%				
Chemicals and Allied Products	38.70%	21.52%	39.78%				
Consumer Durables	11.68%	43.07%	45.26%				
Consumer Non-Durables	43.85%	18.25%	37.91%				
Energy, Oil, Gas and Coal Extraction and Products	29.68%	27.42%	42.90%				
Finance	36.48%	18.45%	45.08%				
Healthcare, Medical Equipment and Drugs	42.81%	15.92%	41.27%				
Manufacturing	50.87%	16.88%	32.26%				
Shops Wholesale, Retail and Services	58.23%	15.96%	25.81%				
Telephone and Television Transmission	46.95%	18.80%	34.25%				
Utilities	29.39%	17.91%	52.70%				
Other	33.41%	15.50%	51.09%				
<b>3%</b> threshold for defining a block		Non-cr	oss-held				
Fama-French 12 Industry	Cross-held	Block-held	Non-Block-held				
Business Equipment	78.36%	5.93%	15.71%				
Chemicals and Allied Products	60.22%	13.48%	26.30%				
Consumer Durables	39.42%	33.94%	26.64%				
Consumer Non-Durables	68.18%	11.32%	20.51%				
Energy, Oil, Gas and Coal Extraction and Products	54.52%	24.84%	20.65%				
Finance	61.58%	12.07%	26.35%				
Healthcare, Medical Equipment and Drugs	66.10%	12.50%	21.40%				
Manufacturing	77.68%	7.49%	14.83%				
Shops Wholesale, Retail and Services	80.86%	8.92%	10.22%				
Telephone and Television Transmission	70.73%	11.08%	18.18%				
Utilities	56.17%	15.65%	28.17%				
Other	50.66%	12.45%	36.90%				

TABLE 7: Distrib. of cross-held and non-cross-held firms in industries (1/2) INSTITUTIONAL INVESTORS ONLY

	Fraction of firm-years across industries			
5% threshold for defining a block	Non-cross-held			
Fama-French 12 Industry	Cross-held	Block-held	Non-Block-held	
Business Equipment	55.67%	34.55%	9.77%	
Chemicals and Allied Products	41.96%	43.04%	15.00%	
Consumer Durables	19.71%	64.23%	16.06%	
Consumer Non-Durables	53.04%	36.21%	10.75%	
Energy, Oil, Gas and Coal Extraction and Products	29.68%	57.74%	12.58%	
Finance	44.80%	36.29%	18.91%	
Healthcare, Medical Equipment and Drugs	43.66%	38.36%	17.98%	
Manufacturing	57.26%	33.75%	8.99%	
Shops Wholesale, Retail and Services	64.80%	29.97%	5.23%	
Telephone and Television Transmission	48.32%	42.71%	8.97%	
Utilities	38.26%	54.96%	6.78%	
Other	54.37%	35.81%	9.83%	
20/ threshold for defining a block	Non-men hold			
<b>5%</b> Intesnota for defining a block		INOII-CE	DSS-neid	
Fama-French 12 Industry	Cross-held	Block-held	Non-Block-held	
Business Equipment	82.02%	14.49%	3.49%	
Chemicals and Allied Products	63.04%	27.17%	9.78%	
Consumer Durables	46.72%	45.26%	8.03%	
Consumer Non-Durables	76.52%	20.65%	2.83%	
Energy, Oil, Gas and Coal Extraction and Products	54.84%	41.94%	3.23%	
Finance	70.06%	20.33%	9.61%	
Healthcare, Medical Equipment and Drugs	66.44%	25.86%	7.71%	
Manufacturing	81.39%	16.01%	2.60%	
Shops Wholesale, Retail and Services	85.42%	13.77%	0.81%	
Telephone and Television Transmission	71.11%	25.90%	2.99%	
Utilities	64.87%	32.70%	2.43%	
Other	68.78%	27.51%	3.71%	

**INVESTORS** 

TABLE 7: Distrib. of cross-held and non-cross-held firms in industries (2	$2/2^{2}$	) ALL
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The table reports the distribution of cross-held companies, non-cross-held but block-held companies, non-cross-held and non-block-held companies across the Fama-French 12 industries, under four different scenarios: institutional investors only, with a minimum threshold for defining a block equal to 5%; institutional investors only, with a minimum threshold for defining a block equal to 5%; institutional and non-institutional investors, with a minimum threshold for defining a block equal to 5%; institutional and non-institutional investors with a minimum threshold for defining a block equal to 5%; institutional and non-institutional investors with a minimum threshold for defining a block equal to 5%; institutional and non-institutional investors with a minimum threshold for defining a block equal to 5%; institutional and non-institutional investors with a minimum threshold for defining a block equal to 5%; institutional and non-institutional investors with a minimum threshold for defining a block equal to 5%; institutional and non-institutional investors with a minimum threshold for defining a block equal to 5%; institutional and non-institutional investors with a minimum threshold for defining a block equal to 5%.

Once we lower the minimum block threshold to a 3% ownership stake, all the figures for cross-held companies are driven upward by at least 17 percentage points and they reach minimum levels equal to 39.42% for the category Consumer Durables and maximum levels of 78.36% and 80.86% in correspondence to Business Equipment and Shops Wholesale respectively. The highest increases in the percentage of cross-block-held enterprises are those in the Business Equipment sector (+26.53%) and even more in the Consumer Durables industry (+27.74%). As far as non-cross-held companies are concerned, both block-held and non-block-held suffer large reductions with respect to the 5% case, but the decreases in non-block-held companies is larger in all sectors. In particular, we can notice a 24.53% decrease (from 52.70% to 28.17%) of block-held firms decreases by 2.26% only), which is a clear signal that a substantial slice of cross-holders in this industry hold ownership stakes between 3% and 5%.

Not surprisingly, when we include all investors in the pool of potential cross-holders, the level of cross-held companies tends to increase, but the magnitude of such expansion is not uniform across the sectors under analysis. If we compare the percentage of cross-held companies at 5% level by institutional investors vis a vis all investors, the largest increase when we shift from the former to the latter can be recognized in the residual category Other (+20.96%, from 33.41% to 54.37%) and Consumer Non-Durables (+9.19%, from 43.85% to 53.04%). This means that the sectors we just identified are marked by a substantial portion of cross-holders (with stakes of more than 5%) that do not belong to the macro-category of institutional investors. On the other hand, there are cases in which there seem not to be (or only to a negligible extent) non institutional cross-investors:

examples can be found in industries such as Energy, Oil, Gas and Coal Extraction and Products, Healthcare, Medical Equipment and Drugs, Telephone and Television Transmission. In these business sectors, when we move from institutional investors crossownership to cross-ownership by all investors, the percentage increase in the level of cross-held companies is equal to 0.00%, 0.86% and 1.37% respectively. If we analyse non-cross-held companies, one can recognize significant extension of the percentages for every industry with respect to the case of institutional investors only. The largest expansions can be referred to Utilities (+37.04%, from 17.91% to 54.96%) and Energy, Oil, Gas and Coal Extraction and Products (+30.32%, from 27.42% to 57.74%), meaning that within these business areas there is a sizeable amount of non-institutional investors holding stakes of at least 5% but without having similar stakes in other companies belonging to the same industry. All these increases are obviously reflected in a straightforward reduction in the portion of firms that are neither cross-held nor blockheld at 5% level by all investors with respect to institutional investors only. Such percentage reaches levels as low as 5.23% (Shops, Wholesale, Retail and Services) and 6.78% (Utilities), while the highest levels are recognizable corresponding to Finance (18.91%) and Healthcare, Medical Equipment and Drugs (17.98%). Decreases with respect to the baseline scenario (institutional investors only, 5% blocks) are everywhere in the range between 20.24% (Business Equipment) and 45.91% (Utilities).

At 3% block level, cross-held companies fluctuate in a range between 46.72% (Consumer Durables) and 85.42% (Shops Wholesale, Retail and Services). If compared to cross-ownership by exclusively institutional investors at 3%, the figure is envisaged to increase and in fact this is the case, with the largest upward jump being related to the category Other (+18.12%, from 50.66% to 68.78%), while the most marginally impacted sectors

are Energy, Oil, Gas and Coal Extraction and Products (+0.32%), Healthcare, Medical Equipment and Drugs (+0.34%) and Telephone and Television Transmission (+0.37%).

If, instead, we compare these percentages to those found in the case of all investors but at a 5% level, cross-held companies grow by more than 20% in each sector (with the only exception of Other, +14.41% from 54.37% to 68.78%), with a maximum increase equal to 27.01% for Consumer Durables (from 19.71% to 46.72%). From this piece of empirical evidence, we can deduct that a considerable fraction of cross-holders does hold ownership stakes of at least 3% but below 5%. Among non-cross-held companies, both block-held and non-block held corporations diminish for each sector once we move from the all investors-5% stake scenario to the all investors-3% stake dimension. In particular, concerning block-held firms, the largest contractions can be referred to the sector of Utilities (-22.26%, from 54.96% to 32.70%) and Business Equipment (-20.07%, from 34.55% to 14.49%). In terms of non-block-held firms, percentages reach values as low as 0.81% (Shops Wholesale, Retail and Services), with reductions with respect to the 5% case that may be equal at most to 10.27% (Healthcare, Medical Equipment and Drugs, from 17.98% to 7.71%).

**FIGURE 3** provides a quick view on the overall distribution of cross-held companies for each year within the time period under analysis. On the one hand, we can recognize a substantial stability over time of the percentage of cross-held firms for each sector with respect to the entire sample. On the other hand, it can be noted that a significant portion of cross-held corporations belongs (if we exclude the residual category Other) to the financial and manufacturing sectors, which is obviously related to the wide presence of companies from these industries within the EuroSTOXX 600 index.


FIGURE 3: DISTRIBUTION OF CROSS-HELD FIRMS ACROSS INDUSTRIES AND YEARS

# 3.6. Relation between cross-ownership and firm performance

## 3.6.1. Multivariate analysis

In order to assess how a company's cross-ownership is statistically related to its future product market performance and operating performance, we estimate a wide set of ordinary least squares panel regressions, starting from the following general models:

$$\begin{split} &MarketShareGrowth_{i,t+1} = \alpha + \beta CrossOwnershipMeasure_{i,t} + \gamma Z_{i,t} + Year_t + Firm_t + \varepsilon_{i,t} \\ &MarketShareGrowth_{i,t+3} = \alpha + \beta CrossOwnershipMeasure_{i,t} + \gamma Z_{i,t} + Year_t + Firm_t + \varepsilon_{i,t} \\ &OperatingProfitMargin_{i,t+1} = \alpha + \beta CrossOwnershipMeasure_{i,t} + \gamma Z_{i,t} + Year_t + Firm_t + \varepsilon_{i,t} \end{split}$$

where *i* indexes company and *t* indexes time (year). The dependent variable is: a (oneyear-ahead or three-year-ahead) measure of market growth computed in one of the two ways we previously defined; the one-year-ahead operating profit margin for the company. *CrossOwnershipMeasure* is one out of the five cross-ownership proxies for firm *i* over year *t*. We also use a univariate regression model whose independent variable is *BlockDummy* in order to recognize whether the existence of ownership blocks can itself explain the variability of market share growth and core business profitability across the sample. *Z* is a vector of firm fundamentals that may contribute to explain the variability of the dependent variable. The number of these control variables ranges from 0 (univariate models) to 9. *Year* captures years fixed effects while *Firm* grasps company fixed effects.

As a preliminary step for running regressions, we set in place a correlation table containing the correlation coefficients for each couple of variables that may be employed throughout the empirical analysis and the respective significance levels. The purpose of such step is that of avoiding, among our models, the inclusion of explanatory variables that are highly correlated to each other (and, as a rule of thumb, we decide not to use in the same regression two independent variables when their correlation coefficient is not below 0.5). The results are reported in **TABLE 8**. To begin with, all cross-ownership measures (as well as the dummy variable for block-holdings) are highly and positively correlated one another, these correlations being always significant at 1% level. Besides, these variables are correlated to assets (as well as natural logarithm of assets), Leverage, ROA, R&D Capital, CapexAssets and (partly) AcqAssets. Market share growth measures are all highly and significantly correlated one another, but they do not appear to be significantly related to cross-ownership measures, at least if we use pairwise correlations. The operating profit margin at time t+1 is neither correlated to cross-ownership nor market share evolution, but it is significantly (and negatively) correlated to CashAssets, Leverage and R&DCapital.

Keeping into consideration the set of information above, we develop regression tables containing five to six regressions each. The models in which the dependent variable is a market share growth measure are reported in **TABLE 9-a/9-t**. In all these models, cross-ownership measures are calculated by considering an ownership stake as a block when the shareholding percentage is not below 5%. Besides, for each of the 5 cross-ownership measures (CrossDummy, NumConnected, NumCross, AvgNum, TotCrossOwn), 4 tables are derived (one for each of the market share growth measures: MktShareGrowtht1, MktShareGrowtht3, LnMktShareGrowtht3) and standard errors are reported within parentheses.

<b>TABLE 8: Pairwise co</b>	orrelations								*** p<0.01	, ** p<0.05, *	<i>• p&lt;0.1</i>
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) BlockDummy	1.000										
(2) CrossDummy	0.685***	1.000									
(3) NumConnected	0.370***	0.540***	1.000								
(4) NumCross	0.540***	0.789***	0.661***	1.000							
(5) AvgNum	0.364***	0.531***	0.854***	0.412***	1.000						
(6) TotalCrossOwn	0.494***	0.721***	0.564***	0.907***	0.339***	1.000					
(7) MktShareGrowt+1	-0.011	-0.009	-0.004	-0.006	-0.003	-0.007	1.000				
(8) LnMktShareGrowt+1	-0.012	-0.010	-0.005	-0.007	-0.003	-0.008	0.996***	1.000			
(9) MktShareGrowt+3	-0.005	0.002	0.009	0.000	0.011	-0.004	0.523***	0.525***	1.000		
(10) LnMktShareGrowt+3	-0.006	0.001	0.009	-0.001	0.011	-0.005	0.517***	0.523***	0.997***	1.000	
(11) $OPM_{t+1}$	-0.007	0.010	0.006	0.008	0.006	0.007	0.002	0.002	0.006	0.006	1.000
(12) Assets	-0.094***	-0.075***	0.066***	-0.086***	0.124***	-0.096***	-0.007	-0.008	-0.019*	-0.020*	0.003
(13) LnAssets	-0.215***	-0.194***	-0.039***	-0.235***	0.043***	-0.241***	-0.016	-0.016*	-0.047***	-0.048***	0.015
(14) Tobinq	-0.007	-0.010	-0.005	-0.001	-0.016*	0.002	0.000	0.000	0.000	0.000	-0.001
(15) CashAssets	-0.002	-0.019*	-0.014	-0.018	-0.013	-0.011	0.003	0.004	0.010	0.010	-0.047**
(16) Leverage	0.106***	0.098***	0.035***	0.116***	-0.007	0.147***	-0.006	-0.006	-0.009	-0.010	-0.021**
(17) ROA	0.060***	0.091***	0.039***	0.106***	0.011	0.095***	0.019*	0.021**	0.026**	0.029**	0.003
(18) RDcapital	0.020**	0.026**	-0.054***	0.004	-0.041***	-0.004	-0.005	-0.005	-0.012	-0.012	-0.061**
(19) CapexAssets	-0.013	-0.040***	-0.082***	-0.042***	-0.086***	-0.033***	-0.005	-0.005	-0.009	-0.008	0.007
(20) AcqAssets	0.033**	0.052***	0.001	0.061***	-0.018	0.053***	0.024*	0.028**	0.026*	0.030**	0.012
(21) PPEGrowtht	-0.008	-0.006	-0.010	-0.009	-0.009	-0.004	0.008	0.009	0.005	0.005	0.003
(22) PPEGrowtht1	0.008	0.009	-0.004	0.001	-0.003	0.002	0.003	0.004	0.003	0.003	0.001
Variables	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(12) Assets	1.000		· ·		· ·			· ·			· · · · · ·
(13) LnAssets	0.631***	1.000									
(14) Tobing	-0.001	0.005	1.000								
(15) CashAssets	-0.061***	-0.183***	0.014	1.000							
(16) Leverage	-0.154***	-0.128***	-0.075***	-0.224***	1.000						
(17) ROA	-0.184***	-0.387***	0.233***	0.154***	0.030***	1.000					
(18) RDcapital	-0.099***	-0.180***	0.011	0.260***	-0.133***	0.109***	1.000				
(19) CapexAssets	-0.208***	-0.227***	0.005	-0.089***	0.153***	0.120***	0.003	1.000			
(20) AcqAssets	-0.118***	-0.190***	0.018	-0.092***	0.120***	0.144***	0.054***	-0.028**	1.000		
(21) PPEGrowtht	-0.007	-0.009	-0.003	0.010	-0.006	-0.001	-0.010	-0.007	0.057***	1.000	
(22) PPEGrowtht1	-0.004	-0.003	0.000	-0.008	0.014	-0.010	-0.006	-0.011	-0.004	-0.004	1.000

The table reports pairwise correlation coefficients among all the variables included in our study. In particular, block-ownership and cross-ownership measures are those computed when institutional investors only are taken into consideration and the minimum threshold for defining a block is set to be equal to 5%.

When CrossDummy is employed as explanatory variable, such coefficient is never significant even at the 10% level, suggesting that, in Europe, institutional cross-ownership cannot be statistically associated with a higher market share growth rate in the following year as well as in the subsequent three years. This would entail that horizontal shareholding does not work systematically as a mean to gain market power for individual companies.

The only control variable that consistently retains explanatory power across these regressions is ROA, whose coefficient is always positive and statistically significant at least at 5% level. Additionally, when we try to explain the variability of the market share evolution in a three-year time frame, the coefficient for LnAssets proves to be always negative and significant at 1% level and those for R&D Capital and CapexAssets are constantly negative and significant (at least at 10% level). Overall, the regression R<sub>2</sub> is substantially low. These same exact patterns of significance are repeated when we use the other four explanatory variables for cross-ownership. Additionally, BlockDummy coefficient is never significant, meaning that the presence itself of at least one investor with a considerable stake in a company cannot explain in any way the variability of that company's market share evolution neither in the short term nor in the medium term.

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)	(6)
Carro	0.000140	0.000057	0.000040	0.000003	0.000005	
CrossDummy	-0.000140	-0.000057	-0.000049	(0.000003	(0.000005	
L e A spots	(0.000210)	0.000232)	0.000200)	0.000439)	0.000439)	
Lintssets		(0.000445)	(0.000404	(0.000/45)	(0.000733	
Tobing		0.000224)	(0.000232)	0.000482)	0.000482)	
robing		-0.000001		(0.000000	(0.000000	
ROA		0.006931***		0.012647**	0.012785**	
ROM		(0.000751		(0.005726)	(0.005723)	
Leverage		(0.002027)	0.000893	0.001575	0.001555	
Leverage			(0.001198)	(0.002366)	(0.002364)	
CashAssets			0.000764	0.000099	0.000121	
Gasinissees			(0.000704)	(0.003107)	(0.003097)	
<b>RD</b> capital			(0.001051)	-0.022486	-0.022532	
Histophan				(0.017482)	(0.017473)	
CapexAssets				-0.011307	-0.011238	
Superintoseto				(0.010061)	(0.010006)	
AcqAssets				0.002855	0.003034	
				(0.002722)	(0.002713)	
PPEG <b>r</b> owtht				0.000108	(0.002,100)	
				(0.000105)		
PPEGrowtht1				()	0.000001	
					(0.000007)	
BlockDummy					(0.000000)	-0.000135
, <u>, , , , , , , , , , , , , , , , , , </u>						(0.000228)
cons	0.000070	0.000603	0.000941	0.001575	0.001540	0.000093
_	(0.000121)	(0.000565)	(0.000624)	(0.001450)	(0.001448)	(0.000161)
Obs.	9571	8945	7762	4503	4508	9571
R-squared	0.000049	0.001455	0.000573	0.003364	0.003090	0.000041
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES
,						

Table 9-a: Regression results (LnMktShareGrowt+1 as dependent variable, CrossDummy as cross-ownership variable)

Table 9-b: Regression results (MktShareGrowt+1 as dependent variable, CrossDummy as cross-ownership variable)

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	0.000138	0.000050	0.000043	0.000007	0.000009	
CrossDunning	-0.000138	-0.000050	-0.000045	(0.000512)	(0.000512)	
InAssets	(0.000247)	0.000207)	0.000300)	0.000312)	0.000790	
1.11/155015		(0.000258)	(0.000420	(0.000563)	(0.0007562)	
Tobing		0.000230)	(0.000270)	0.0000000	0.0000002)	
robing		(0.000001		(0.000000	(0.000014)	
ROA		0.007260**		0.013412**	0.013556**	
ROM		(0.007200		(0.006683)	(0.006679)	
Lowence		(0.005025)	0.000040	0.000083)	0.001679	
Leverage			-0.000949	-0.001700	-0.001078	
Carle Assarts			(0.001360)	(0.002762)	(0.002739)	
CashAssets			0.000811	0.000065	0.000088	
			(0.002109)	(0.005626)	(0.005614)	
RDcapital				-0.025891	-0.023942	
				(0.020403)	(0.020392)	
CapexAssets				-0.012840	-0.012/5/	
				(0.011743)	(0.011677)	
AcqAssets				0.002/01	0.002889	
				(0.003177)	(0.003166)	
PPEGrowtht				0.000113		
				(0.000123)		
PPEGrowtht1					0.000001	
					(0.000008)	
BlockDummy						-0.000137
						(0.000263)
_cons	0.000063	0.000611	0.000970	0.001741	0.001704	0.000088
	(0.000139)	(0.000650)	(0.000719)	(0.001692)	(0.001689)	(0.000185)
Obs.	9571	8945	7762	4503	4508	9571
R-squared	0.000036	0.001196	0.000470	0.002745	0.002525	0.000032
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)	(6)
Cara	0.000074	0.000246	0.000202	0.000257	0.000257	
CrossDummy	0.000074	0.000346	0.000293	0.000357	0.000557	
T. a. A. a. a. da	(0.000293)	(0.000512)	(0.000356)	(0.000570)	(0.000570)	
LnAssets		-0.002843	-0.002889	-0.003636	-0.003632	
T 1		(0.000508)	(0.000349)	(0.000657)	(0.000656)	
Tobinq		-0.00001		-0.000007	-0.000007	
DOA		(0.00004)		(0.000014)	(0.000014)	
ROA		0.009249**		0.010922**	0.010942**	
-		(0.003696)		(0.004472)	(0.004468)	
Leverage			0.000025	0.000895	0.000898	
			(0.001577)	(0.003094)	(0.003093)	
CashAssets			0.001515	-0.001233	-0.001234	
			(0.002450)	(0.004094)	(0.004091)	
RDcapital				-0.048644**	-0.048599**	
				(0.023370)	(0.023359)	
CapexAssets				-0.024068*	-0.023991*	
				(0.012784)	(0.012777)	
AcqAssets				0.000095	0.000163	
				(0.003502)	(0.003488)	
PPEGrowtht				0.000035		
				(0.000159)		
PPEGrowtht1					0.000000	
					(0.000009)	
BlockDummy						0.000127
,						(0.000307)
cons	-0.000182	0.005638***	0.005107***	0.007677***	0.007664***	-0.000228
	(0.000160)	(0.000771)	(0.000846)	(0.001922)	(0.001920)	(0.000213)
Obs.	8090	7580	6550	3850	3854	8090
R-squared	0.000009	0.013814	0.012430	0.010721	0.010703	0.000024
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES
I can D uninity	110	110	110	110	110	110

 Table 9-c: Regression results (LnMktShareGrowt+3 as dependent variable, CrossDummy as cross-ownership variable)

 Table 9-d: Regression results (MktShareGrowt+3 as dependent variable, CrossDummy as cross-ownership variable)

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	0.000096	0.000384	0.000331	0.000388	0.000388	
	(0.000334)	(0.000356)	(0.000407)	(0.000661)	(0.000661)	
LnAssets		-0.003003***	-0.003061***	-0.003955***	-0.003950***	
		(0.000351)	(0.000399)	(0.000761)	(0.000761)	
Tobinq		-0.000002		-0.000008	-0.000008	
-		(0.000005)		(0.000016)	(0.000016)	
ROA		0.009209**		0.010590**	0.010611**	
		(0.004219)		(0.004663)	(0.004359)	
Leverage			0.000107	0.001129	0.001132	
Ũ			(0.001804)	(0.003588)	(0.003585)	
CashAssets			0.001705	-0.001302	-0.001303	
			(0.002802)	(0.004747)	(0.004743)	
RDcapital				-0.052994*	-0.052944*	
				(0.027095)	(0.027081)	
CapexAssets				-0.027493*	-0.027408*	
				(0.014822)	(0.014813)	
AcqAssets				-0.000340	-0.000263	
1				(0.004061)	(0.004044)	
PPEGrowtht				0.000040	· · · · ·	
				(0.000184)		
PPEGrowtht1				· · · · ·	0.000000	
					(0.000010)	
BlockDummy					( )	0.000151
,						(0.000350)
cons	-0.000219	0.005965***	0.005354***	0.008468***	0.008453***	-0.000271
-	(0.000182)	(0.000880)	(0.000968)	(0.002228)	(0.002226)	(0.000243)
Obs.	8090	7580	6550	3850	3854	<b>8090</b>
R-squared	0.000012	0.011766	0.010703	0.009372	0.009355	0.000026
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumConnected	-0.000011	-0.000003	0.000000	0.000009	0.000009
	(0.000017)	(0.000019)	(0.000026)	(0.000046)	(0.000046)
LnAssets	· · · ·	-0.000443**	-0.000408	-0.000756	-0.000745
		(0.000225)	(0.000254)	(0.000484)	(0.000484)
Tobing		-0.000001		-0.000000	-0.000000
		(0.000003)		(0.000012)	(0.000012)
ROA		0.006931***		0.012676**	0.012814**
		(0.002629)		(0.005727)	(0.005724)
Leverage			-0.000900	-0.001579	-0.001560
			(0.001197)	(0.002365)	(0.002363)
CashAssets			0.000752	0.000082	0.000103
			(0.001834)	(0.003108)	(0.003098)
RDcapital				-0.022493	-0.022540
				(0.017481)	(0.017471)
CapexAssets				-0.011254	-0.011185
				(0.010065)	(0.010009)
AcqAssets				0.002865	0.003043
				(0.002721)	(0.002712)
PPEGrowtht				0.000108	
				(0.000105)	
PPEGrowtht1					0.000001
					(0.000007)
_cons	0.000040	0.000588	0.000930	0.001573	0.001539
	(0.000091)	(0.000562)	(0.000622)	(0.001444)	(0.001442)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000047	0.001451	0.000568	0.003374	0.003101
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

 Table 9-e: Regression results (LnMktShareGrowt+1 as dependent variable, NumConnected as cross-ownership variable)

Table 7-1. Regression results (MikishareGrowt + 1 as dependent variable, Indiriconnected as cross-ownership variab	f: Regression results (MktShareGrowt+1 as dependent variable, NumConnected as cross-ownersh	ip variable)
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MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumConnected	-0.000011	-0.000003	0.000000	0.000010	0.000010
	(0.000020)	(0.000022)	(0.000030)	(0.000054)	(0.000054)
LnAssets		-0.000460*	-0.000424	-0.000812	-0.000801
		(0.000259)	(0.000293)	(0.000565)	(0.000565)
Tobinq		-0.000001		-0.000000	-0.000000
*		(0.000004)		(0.000014)	(0.000014)
ROA		0.007260**		0.013442**	0.013586**
		(0.003023)		(0.006684)	(0.006680)
Leverage			-0.000954	-0.001704	-0.001682
			(0.001379)	(0.002761)	(0.002758)
CashAssets			0.000800	0.000045	0.000070
			(0.002112)	(0.003627)	(0.003615)
RDcapital				-0.023899	-0.023951
				(0.020402)	(0.020391)
CapexAssets				-0.012783	-0.012701
				(0.011747)	(0.011681)
AcqAssets				0.002711	0.002899
				(0.003176)	(0.003165)
PPEGrowtht				0.000113	
				(0.000123)	
PPEGrowtht1					0.000001
	0.0000	0.000505	0.000044	0.004740	(0.000008)
_cons	0.000034	0.000597	0.000961	0.001740	0.001/04
	(0.000105)	(0.000647)	(0.000/17)	(0.001685)	(0.001683)
Obs.	95/1	8945	7762	4503	4508
R-squared	0.000036	0.001194	0.000467	0.002/54	0.002534
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000009	0.000045	0.000019	0.000025	0.000025
	(0.000027)	(0.000029)	(0.000038)	(0.000066)	(0.000066)
LnAssets	. ,	-0.002864***	-0.002888***	-0.003634***	-0.003629***
		(0.000308)	(0.000350)	(0.000658)	(0.000657)
Tobinq		-0.000002		-0.000007	-0.000007
		(0.000004)		(0.000014)	(0.000014)
ROA		0.009346**		0.010887**	0.010907**
		(0.003697)		(0.004475)	(0.004471)
Leverage			0.000080	0.000953	0.000957
			(0.001576)	(0.003093)	(0.003091)
CashAssets			0.001496	-0.001232	-0.001231
			(0.002454)	(0.004096)	(0.004092)
RDcapital				-0.048621**	-0.048575**
				(0.023371)	(0.023360)
CapexAssets				-0.023916*	-0.023838*
				(0.012794)	(0.012787)
AcqAssets				0.000019	0.000087
				(0.003500)	(0.003486)
PPEGrowtht				0.000035	
				(0.000159)	
PPEGrowtht1					0.000000
	0.000172	0.00571.4***	0.005177***	0.007770***	(0.000009)
_cons	-0.0001/3	0.005/16***	0.0051//***	$(0.007760^{***})$	$0.00//46^{***}$
Oba	(0.000122)	(0.000767)	(0.000842)	(0.001915)	(0.001915)
DDS. Paguarad	0.000017	0.013084	0.012357	0.010646	0.010628
K-squared	0.000017 VES	0.015964 VES	0.012557 VES	0.010040 VES	0.010020 VES
Veer Dummy	1E5 VES	VES	VES	VES	VES
Tear Dunning	1E3	1 E3	1 E.3	1 E.5	1 E3

Table 9-g: Regression results (LnMktShareGrowt+3 as dependent variable, NumConnected as cross-ownership variable)

1 able 9-n: Regression results (MktSnareGrowt+5 as dependent variable, NumConnected as cross-own
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MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000010	0.000047	0.000022	0.000027	0.000027
	(0.000031)	(0.000033)	(0.000044)	(0.000076)	(0.000076)
LnAssets		-0.003024***	-0.003060***	-0.003952***	-0.003947***
		(0.000352)	(0.000401)	(0.000762)	(0.000762)
Tobinq		-0.000002		-0.000008	-0.000008
		(0.000005)		(0.000016)	(0.000016)
ROA		0.009311**		0.010550**	0.010572**
		(0.004220)		(0.004667)	(0.004662)
Leverage			0.000169	0.001193	0.001196
			(0.001803)	(0.003586)	(0.003584)
CashAssets			0.001683	-0.001299	-0.001300
			(0.002808)	(0.004748)	(0.004745)
RDcapital				-0.052969*	-0.052919*
				(0.027096)	(0.027082)
CapexAssets				-0.027330*	-0.027244*
				(0.014833)	(0.014824)
AcqAssets				-0.000422	-0.000345
*				(0.004058)	(0.004041)
PPEGrowtht				0.000040	
				(0.000184)	
PPEGrowtht1					0.000000
					(0.000010)
_cons	-0.000204	0.006053***	0.005433***	0.008558***	0.008543***
	(0.000139)	(0.000875)	(0.000963)	(0.002220)	(0.002218)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000016	0.011896	0.010631	0.009304	0.009288
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

.nMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000067	-0.000019	-0.000029	-0.000016	-0.000015
	(0.000112)	(0.000121)	(0.000136)	(0.000221)	(0.000221)
LnAssets		-0.000446**	-0.000404	-0.000743	-0.000733
		(0.000224)	(0.000252)	(0.000482)	(0.000481)
Tobinq		-0.000001		0.000000	0.000000
_		(0.000003)		(0.000012)	(0.000012)
ROA		0.006917***		0.012635**	0.012773**
		(0.002631)		(0.005728)	(0.005724)
Leverage			-0.000893	-0.001570	-0.001550
			(0.001197)	(0.002366)	(0.002363)
CashAssets			0.000762	0.000099	0.000121
			(0.001831)	(0.003106)	(0.003096)
RDcapital				-0.022496	-0.022543
*				(0.017481)	(0.017472)
CapexAssets				-0.011320	-0.011250
•				(0.010062)	(0.010007)
AcqAssets				0.002852	0.003031
<b>^</b>				(0.002721)	(0.002712)
PPEGrowtht				0.000108	
				(0.000105)	
PPEGrowtht1				. ,	0.000001
					(0.000007)
_cons	0.000057	0.000599	0.000941	0.001585	0.001551
	(0.000111)	(0.000565)	(0.000624)	(0.001450)	(0.001448)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000042	0.001451	0.000574	0.003365	0.003091
Firm Dummy	YES	YES	YES	YES	YES
lear Dummy	YES	YES	YES	YES	YES

Table 9-i: Regression results (	LnMktShareGrowt+1 as de	pendent variable,	NumCross as cross-ownership	p variable)

Table 9-i: Regression results	(MktShareGrowt+1 as dependent variable	NumCross as cross-ownership	n variable)
Table 7-1. Regression results	(mikionalcolowi i as acpendent vanable	1 1 uniteross as cross-ownersing	j vanabic j

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000068	-0.000018	-0.000028	-0.000017	-0.000016
	(0.000129)	(0.000139)	(0.000156)	(0.000258)	(0.000258)
LnAssets		-0.000462*	-0.000420	-0.000798	-0.000787
		(0.000257)	(0.000290)	(0.000562)	(0.000562)
Tobinq		-0.000001		0.000000	0.000000
		(0.000004)		(0.000014)	(0.000014)
ROA		0.007247**		0.013398**	0.013541**
		(0.003026)		(0.006685)	(0.006681)
Leverage			-0.000948	-0.001694	-0.001673
			(0.001379)	(0.002761)	(0.002758)
CashAssets			0.000811	0.000063	0.000089
			(0.002109)	(0.003625)	(0.003614)
RDcapital				-0.023903	-0.023954
				(0.020402)	(0.020391)
CapexAssets				-0.012854	-0.012770
				(0.011744)	(0.011679)
AcqAssets				0.002698	0.002885
				(0.003175)	(0.003165)
PPEGrowtht				0.000113	
				(0.000123)	
PPEGrowtht1					0.000001
					(0.000008)
_cons	0.000052	0.000607	0.000971	0.001753	0.001716
	(0.000128)	(0.000650)	(0.000719)	(0.001692)	(0.001689)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000033	0.001193	0.000471	0.002747	0.002526
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000007	0.000126	0.000069	0.000016	0.000016
	(0.000151)	(0.000161)	(0.000179)	(0.000286)	(0.000285)
LnAssets	(******)	-0.002834***	-0.002875***	-0.003615***	-0.003611***
		(0.000307)	(0.000348)	(0.000656)	(0.000656)
Tobing		-0.000002	()	-0.000007	-0.000007
1		(0.000004)		(0.000014)	(0.000014)
ROA		0.009354**		0.010783**	0.010803**
		(0.003700)		(0.004478)	(0.004474)
Leverage		(******)	0.000052	0.000957	0.000960
			(0.001576)	(0.003094)	(0.003092)
CashAssets			0.001559	-0.001180	-0.001180
			(0.002449)	(0.004094)	(0.004091)
RDcapital			(	-0.048625**	-0.048579**
				(0.023373)	(0.023361)
CapexAssets				-0.024089*	-0.024011*
				(0.012789)	(0.012782)
AcqAssets				0.000012	0.000081
1				(0.003500)	(0.003486)
PPEGrowtht				0.000035	()
				(0.000159)	
PPEGrowtht1				()	0.000000
					(0.000009)
cons	-0.000146	0.005667***	0.005148***	0.007780***	0.007766***
	(0.000146)	(0.000771)	(0.000845)	(0.001923)	(0.001922)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000000	0.013724	0.012339	0.010601	0.010583
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES
· · · · · · · · · ·					

Table 9-k: Regression results (LnMktShareGrowt+3 as dependent variable, NumCross as cross-ownership varial	ble)	
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I able 9-1: Regression results (MikiShareurowitt) as dependent variable. Numuross as cross-ownership var	iable. NumCross as cross-ownership variable)	variable. N	as dependen	tShareGrowt+3	results (N	Regression	Table 9-1:
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MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000002	0.000137	0.000078	0.000018	0.000018
	(0.000172)	(0.000184)	(0.000205)	(0.000331)	(0.000331)
LnAssets		-0.002992***	-0.003046***	-0.003932***	-0.003927***
		(0.000351)	(0.000399)	(0.000761)	(0.000760)
Tobinq		-0.000002		-0.000008	-0.000008
		(0.000005)		(0.000016)	(0.000016)
ROA		0.009322**		0.010439**	0.010460**
		(0.004224)		(0.004670)	(0.004665)
Leverage			0.000137	0.001197	0.001200
			(0.001804)	(0.003587)	(0.003585)
CashAssets			0.001754	-0.001244	-0.001245
			(0.002802)	(0.004746)	(0.004742)
RDcapital				-0.052973*	-0.052922*
				(0.027098)	(0.027084)
CapexAssets				-0.027515*	-0.027429*
				(0.014827)	(0.014819)
AcqAssets				-0.000429	-0.000352
				(0.004058)	(0.004042)
PPEGrowtht				0.000040	
				(0.000184)	
PPEGrowtht1					0.000000
	· · · · · · - ·			· · · · · · · · · · · · · · · · · · ·	(0.000010)
_cons	-0.000178	0.0059999***	0.005401***	0.008579***	0.008564***
	(0.000167)	(0.000880)	(0.000967)	(0.002230)	(0.002228)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000000	0.011675	0.010614	0.009266	0.009249
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

	(2)	(5)	(ד)	(5)
-0.000009	-0.000002	0.000014	0.000030	0.000031
(0.000025)	(0.000027)	(0.000044)	(0.000076)	(0.000076)
	-0.000446**	-0.000421*	-0.000770	-0.000760
	(0.000225)	(0.000254)	(0.000485)	(0.000485)
	-0.000001		-0.000000	-0.000000
	(0.000003)		(0.000012)	(0.000012)
	0.006935***		0.012651**	0.012789*
	(0.002629)		(0.005725)	(0.005722)
	. ,	-0.000890	-0.001584	-0.001564
		(0.001197)	(0.002365)	(0.002363)
		0.000723	0.000079	0.000100
		(0.001832)	(0.003107)	(0.003097)
			-0.022445	-0.022491
			(0.017481)	(0.017471)
			-0.011225	-0.011158
			(0.010063)	(0.010007)
			0.002885	0.003063
			(0.002722)	(0.002713)
			0.000107	(0100=110)
			(0.000105)	
			(0.000100)	0.000001
				(0.000007)
0.000025	0.000588	0.000936	0.001580	0.001546
(0.000088)	(0.000562)	(0.000622)	(0.001444)	(0.001442)
9571	8945	7762	4503	4508
0.000015	0 001448	0.000583	0.003406	0.003133
VES	VES	VES	VES	VES
VES	VES	VES	VES	VES
	-0.00009 (0.000025) 0.000025 (0.000025 (0.000088) 9571 0.000015 YES YES	$\begin{array}{cccc} -0.000009 & -0.000002 \\ (0.000025) & (0.000027) \\ -0.000446^{**} \\ (0.000225) \\ -0.000001 \\ (0.000003) \\ 0.006935^{***} \\ (0.002629) \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

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Table 9-n: Regression results	MktShareGrowt+1 as dependent variable.	AvgNum as cross-owner	ship variable)
rable / m rectrebelon recard	in a condition of the c		

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
AvgNum	-0.000009	-0.000001	0.000015	0.000032	0.000032
Ŭ	(0.000029)	(0.000032)	(0.000050)	(0.000089)	(0.000089)
LnAssets		-0.000463*	-0.000438	-0.000827	-0.000816
		(0.000259)	(0.000293)	(0.000566)	(0.000566)
Tobinq		-0.000001		-0.000000	-0.000000
		(0.000004)		(0.000014)	(0.000014)
ROA		0.007263**		0.013416**	0.013559**
		(0.003024)		(0.006682)	(0.006678)
Leverage			-0.000944	-0.001709	-0.001687
			(0.001379)	(0.002761)	(0.002757)
CashAssets			0.000770	0.000042	0.000066
			(0.002111)	(0.003626)	(0.003614)
RDcapital				-0.023849	-0.023900
				(0.020402)	(0.020391)
CapexAssets				-0.012754	-0.012673
				(0.011745)	(0.011679)
AcqAssets				0.002732	0.002920
				(0.003176)	(0.003166)
PPEGrowtht				0.000112	
				(0.000123)	
PPEGrowtht1					0.000001
					(0.000008)
_cons	0.000019	0.000598	0.000966	0.001747	0.001711
	(0.000101)	(0.000647)	(0.000717)	(0.001685)	(0.001683)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000012	0.001191	0.000479	0.002779	0.002559
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000023	0.000072*	0.000047	0.000061	0.000061
	(0.000040)	(0.000043)	(0.000066)	(0.000110)	(0.000110)
LnAssets		-0.002870***	-0.002899***	-0.003651***	-0.003646***
		(0.000308)	(0.000351)	(0.000659)	(0.000658)
Tobinq		-0.000002		-0.000007	-0.000007
*		(0.000004)		(0.000014)	(0.000014)
ROA		0.009240**		0.010833**	0.010853**
		(0.003696)		(0.004469)	(0.004465)
Leverage			0.000089	0.000964	0.000967
e			(0.001576)	(0.003093)	(0.003091)
CashAssets			0.001485	-0.001241	-0.001241
			(0.002452)	(0.004095)	(0.004092)
RDcapital			· · · · ·	-0.048681**	-0.048636**
1				(0.023371)	(0.023359)
CapexAssets				-0.023962*	-0.023884*
L				(0.012787)	(0.012779)
AcqAssets				0.000046	0.000113
1				(0.003500)	(0.003486)
PPEGrowtht				0.000035	( )
				(0.000159)	
PPEGrowtht1				()	0.000000
					(0.000009)
cons	-0.000185	0.005740***	0.005178***	0.007774***	0.007760***
	(0.000119)	(0.000766)	(0.000842)	(0.001913)	(0.001912)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000047	0.014048	0.012399	0.010695	0.010677
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

	Table 9-0: Regression results	(LnMktShareGrowt+3 as dep	pendent variable, Avg	gNum as cross-ownershi	p variable)
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Table 9-n: Regression results	(MktShareGrowt+3 as dependent v	ariable AvoNum as cross-	ownershin variable)
Table 7-D. Regression results	INIKISHAICOIUWI I J as uchenuchi v	anabic. Avginum as cross-	OWNEISHID Valiablei

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000025	0.000076	0.000052	0.000066	0.000066
-	(0.000046)	(0.000049)	(0.000076)	(0.000128)	(0.000128)
LnAssets	. ,	-0.003030***	-0.003072***	-0.003970***	-0.003965***
		(0.000352)	(0.000401)	(0.000764)	(0.000763)
Tobinq		-0.000002		-0.000008	-0.000008
		(0.000005)		(0.000016)	(0.000016)
ROA		0.009198**		0.010493**	0.010515**
		(0.004218)		(0.004659)	(0.004655)
Leverage			0.000179	0.001204	0.001207
			(0.001803)	(0.003585)	(0.003583)
CashAssets			0.001673	-0.001310	-0.001310
			(0.002805)	(0.004748)	(0.004744)
RDcapital				-0.053034*	-0.052984*
				(0.027095)	(0.027082)
CapexAssets				-0.027378*	-0.027292*
				(0.014825)	(0.014816)
AcqAssets				-0.000393	-0.000317
				(0.004058)	(0.004042)
PPEGrowtht				0.000039	
				(0.000184)	
PPEGrowtht1					0.000000
					(0.000010)
_cons	-0.000216	0.006078 * * *	0.005435***	0.008573***	0.008558***
	(0.000135)	(0.000875)	(0.000963)	(0.002218)	(0.002217)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000042	0.011951	0.010669	0.009348	0.009331
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.000960	-0.000583	-0.000666	-0.000686	-0.000679
	(0.001308)	(0.001420)	(0.001586)	(0.002655)	(0.002655)
LnAssets	()	-0.000444**	-0.000403	-0.000741	-0.000730
		(0.000224)	(0.000251)	(0.000481)	(0.000481)
Tobing		-0.000001	· · · ·	0.000000	0.000000
*		(0.000003)		(0.000012)	(0.000012)
ROA		0.006893***		0.012584**	0.012721**
		(0.002631)		(0.005730)	(0.005727)
Leverage			-0.000865	-0.001557	-0.001537
			(0.001200)	(0.002366)	(0.002364)
CashAssets			0.000761	0.000090	0.000112
			(0.001830)	(0.003107)	(0.003097)
RDcapital				-0.022517	-0.022564
				(0.017481)	(0.017472)
CapexAssets				-0.011381	-0.011311
				(0.010065)	(0.010009)
AcqAssets				0.002853	0.003031
				(0.002721)	(0.002712)
PPEGrowtht				0.000108	
				(0.000105)	
PPEGrowtht1					0.000001
			· · · · · · ·	<b>.</b>	(0.000007)
_cons	0.000064	0.000616	0.000951	0.001615	0.001581
	(0.000107)	(0.000566)	(0.000624)	(0.001452)	(0.001450)
Obs.	95/2	8946	//62	4503	4508
K-squared	0.000063	0.001469	0.000594	0.003382	0.003108
Firm Dummy	YES	YES	YES	YES	YES VEC
r ear Dummy	YES	YES	1ES	YES	YES

Table 9-r: Regression results	(MktShareGrowt+1 as der	pendent variable.	TotalCrossOwn as cross-ownership variable	e)
	(indicondicolowit - 1 do de			~ •

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.000991	-0.000596	-0.000689	-0.000727	-0.000721
	(0.001504)	(0.001633)	(0.001827)	(0.003099)	(0.003098)
LnAssets	· · · · ·	-0.000460*	-0.000418	-0.000796	-0.000785
		(0.000257)	(0.000289)	(0.000562)	(0.000561)
Tobing		-0.000001	. ,	0.000000	0.000000
*		(0.000004)		(0.000014)	(0.000014)
ROA		0.007220**		0.013345**	0.013487**
		(0.003026)		(0.006688)	(0.006684)
Leverage			-0.000919	-0.001680	-0.001658
			(0.001382)	(0.002762)	(0.002759)
CashAssets			0.000811	0.000053	0.000079
			(0.002108)	(0.003626)	(0.003614)
RDcapital				-0.023925	-0.023977
				(0.020402)	(0.020391)
CapexAssets				-0.012919	-0.012835
				(0.011747)	(0.011682)
AcqAssets				0.002698	0.002886
				(0.003175)	(0.003165)
PPEGrowtht				0.000113	
				(0.000123)	
PPEGrowtht1					0.000001
	0 000050	0.000/0/		0.004504	(0.000008)
_cons	0.000059	0.000626	0.000982	0.001/84	0.001/48
	(0.000123)	(0.000651)	(0.000/18)	(0.001695)	(0.001692)
Obs.	95/2	8946	//62	4503	4508
K-squared	0.000051	0.001208	0.000487	0.002760	0.002539
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.001029	-0.000123	-0.000624	-0.001226	-0.001224
	(0.001740)	(0.001878)	(0.002069)	(0.003376)	(0.003374)
LnAssets	( )	-0.002820***	-0.002863***	-0.003608***	-0.003604***
		(0.000307)	(0.000348)	(0.000656)	(0.000655)
Tobinq		-0.000001	. ,	-0.000007	-0.000007
-		(0.000004)		(0.000014)	(0.000014)
ROA		0.009204**		0.010594**	0.010612**
		(0.003700)		(0.004482)	(0.004479)
Leverage			0.000108	0.001004	0.001008
			(0.001581)	(0.003095)	(0.003093)
CashAssets			0.001585	-0.001209	-0.001208
			(0.002449)	(0.004094)	(0.004091)
RDcapital				-0.048722**	-0.048676**
				(0.023372)	(0.023361)
CapexAssets				-0.024265*	-0.024188*
				(0.012792)	(0.012784)
AcqAssets				0.000005	0.000073
				(0.003500)	(0.003486)
PPEGrowtht				0.000035	
				(0.000159)	
PPEGrowtht1					0.000000
					(0.000009)
_cons	-0.000094	0.005/39***	0.005196***	0.007867***	0.00/854***
	(0.000141)	(0.0007/2)	(0.000845)	(0.001925)	(0.001924)
Obs.	8090	7580	6550	3850	3854
K-squared	0.000049	0.013633	0.012329	0.010641	0.010623
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

Table 9-t: Regression results	(MktShareGrowt+3 as dep	pendent variable,	TotalCrossOwn as cross-or	wnership variable)
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MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.001044	-0.000099	-0.000614	-0.001309	-0.001309
	(0.001983)	(0.002144)	(0.002367)	(0.003914)	(0.003912)
LnAssets		-0.002978***	-0.003033***	-0.003924***	-0.003919***
		(0.000350)	(0.000398)	(0.000760)	(0.000760)
Tobing		-0.000002		-0.000008	-0.000008
-		(0.000005)		(0.000016)	(0.000016)
ROA		0.009163**		0.010236**	0.010256**
		(0.004223)		(0.004675)	(0.004671)
Leverage			0.000196	0.001247	0.001251
			(0.001809)	(0.003588)	(0.003586)
CashAssets			0.001783	-0.001275	-0.001275
			(0.002801)	(0.004747)	(0.004743)
RDcapital			. ,	-0.053077*	-0.053027*
-				(0.027097)	(0.027084)
CapexAssets				-0.027704*	-0.027620*
-				(0.014830)	(0.014822)
AcqAssets				-0.000437	-0.000360
*				(0.004058)	(0.004041)
PPEGrowtht				0.000040	
				(0.000184)	
PPEGrowtht1					0.000000
					(0.000010)
_cons	-0.000121	0.006075***	0.005452***	0.008673***	0.008658***
	(0.000161)	(0.000881)	(0.000966)	(0.002232)	(0.002230)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000039	0.011593	0.010601	0.009300	0.009283
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

**TABLE 10-a/10-e** report the results of regressing OPM<sub>t+1</sub> over the five measures of crossownership: LnAssets is always negative and statistically significant at least at 10% level, ROA is positive and significant at 1% level, PPE growth is negative both when referred to year t and year t+1. There is some evidence that the coefficients for cross-ownership measures (especially CrossDummy, NumCross and TotalCrossOwn) are positive and statistically significant, but significance tends to disappear once we include more explanatory variables in the model for control purposes.

OPM <sub>t+1</sub>	(1)	(2)	(3)	(4)	(5)	(6)
CassaDummu	0.000759*	0.005447*	0.114726*	0.005060	0.005052	
CrossDunning	(0.053050)	(0.029274)	(0.669065)	(0.005009	(0.005052	
L # A agota	(0.055959)	(0.036274)	0.010641*	0.012444**	(0.003407)	
Linassets		(0.005614)	-0.010041	-0.012444	-0.011070	
Tobing		0.000270	(0.000329)	0.000066	0.000066	
Tobiliq		(0.000270		(0.000000	(0.000000	
POA		0.185647***		0.478653***	0.476404***	
ROM		(0.065684)		(0.060407)	(0.070373)	
Lovoraço		(0.005084)	0.023123	0.031052	0.010011	
Levelage			(0.020120	-0.031032	-0.019011	
CashAssats			0.144804***	0.028707)	0.029112)	
Casill'issets			(0.045801)	(0.037534)	(0.020011)	
PDcopital			(0.045801)	0.180043	0.167221	
RDeapital				-0.180943	-0.10/221	
CapayAssata				0.173457	0.081441	
Capex/issets				-0.173437	-0.081441	
A co A soots				0.018042	0.021006	
reqrissels				-0.018942	-0.021000	
DDEC rowtht				0.002276*	(0.033420)	
FFEGIOWUIt				-0.002270*		
DDEC rowtht1				(0.001279)	0.000103**	
PreGiowuiti					-0.000193	
PloalsDummer					(0.000087)	0.275052
BIOCKDunniny						-0.275055
20.00	0.400909*	2.024520	1 707209	0 129225***	0 125967***	0.101413
_cons	-0.499898*	-2.034559	-1./0/208	0.138223***	(0.017720)	0.101415
Oha	(0.302108)	(1.410647)	(1.505/51)	(0.017562)	(0.017730)	(0.401764)
Obs.	9/31	9100	/ 000	45/5	4380	9/31
K-squared	0.000396	0.002054	0.002/85	0.015206 XTE	0.015545	0.000027 XTES
Firm Dummy	YES	YES	YES	YES	YES	YES
i ear Dummy	1ES	YES	YES	1ES	YES	YES

 Table 10-a: Regression results (OPMt+1 as dependent variable, CrossDummy as cross-ownership variable)

OPM <sub>t+1</sub>	(1)	(2)	(3)	(4)	(5)
NumConnected	0.056417	0.048686	0.097970	0.000199	0.000178
	(0.043266)	(0.047710)	(0.066022)	(0.000557)	(0.000564)
LnAssets	· · · ·	-0.120069**	-0.101667*	-0.012284**	-0.010885*
		(0.056362)	(0.053809)	(0.005884)	(0.005955)
Tobing		0.000040	. ,	0.000065	0.000065
		(0.008307)		(0.000139)	(0.000141)
ROA		0.185835***		0.478114***	0.475814***
		(0.065692)		(0.069514)	(0.070391)
Leverage			0.025788	-0.030380	-0.018328
0			(0.030242)	(0.028760)	(0.029105)
CashAssets			-0.146528***	0.006134	0.029213
			(0.045872)	(0.037551)	(0.037958)
RDcapital				-0.183611	-0.169840
1				(0.212939)	(0.215688)
CapexAssets				-0.172587	-0.080691
1				(0.121930)	(0.123150)
AcqAssets				-0.019753	-0.021829
1				(0.033083)	(0.033417)
PPEG <b>r</b> owtht				-0.002272*	(
				(0.001279)	
PPEGrowtht1					-0.000192**
					(0.000088)
cons	-0.226350	-1.773612	-1.397388	0.139645***	0.127283***
	(0.226927)	(1.403742)	(1.559333)	(0.017496)	(0.017663)
Obs.	9731	9100	7888	4575	4580
R-squared	0.000197	0.001850	0.002679	0.015008	0.015147
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	VES	VES	VES	VES

Table 10-b: Regression results (OPMt+1 as dependent variable, NumConnected as cross-ownership variable)

 Table 10-c: Regression results (OPMt+1 as dependent variable, NumCross as cross-ownership variable)

OPM <sub>t+1</sub>	(1)	(2)	(3)	(4)	(5)
NumCross	0.063148**	0.060418**	0.718801**	0.000745	0.000619
	(0.027909)	(0.030249)	(0.341003)	(0.002687)	(0.002722)
LnAssets		-0.119800**	-0.106332*	-0.012126**	-0.010737*
		(0.056047)	(0.063189)	(0.005853)	(0.005924)
Tobinq		-0.000159	. ,	0.000065	0.000065
_		(0.008305)		(0.000139)	(0.000141)
ROA		0.180880***		0.478077***	0.475740***
		(0.065735)		(0.069524)	(0.070401)
Leverage			0.022929	-0.030449	-0.018377
			(0.030239)	(0.028766)	(0.029111)
CashAssets			-0.144471***	0.006609	0.029636
			(0.045783)	(0.037528)	(0.037936)
RDcapital				-0.183039	-0.169343
				(0.212940)	(0.215688)
CapexAssets				-0.173249	-0.081318
				(0.121902)	(0.123121)
AcqAssets				-0.019883	-0.021951
DDEC				(0.033079)	(0.033414)
PPEGrowtht				-0.002272*	
DDEC acceptat1				(0.0012/9)	0.000102**
PreGrowulti					-0.000192***
cons	0.520185*	2 095174	1 725602	0 130253***	0.126961***
_cons	(0.276913)	(1.411007)	(1 563925)	(0.017566)	(0.017735)
Obs	9731	9100	7888	4575	4580
R-squared	0.000594	0.002216	0.003000	0.014995	0.015134
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

OPM <sub>t+1</sub>	(1)	(2)	(3)	(4)	(5)
	0.040455	0.024250	0.000200	0.004.04.6	0.000000
AvgNum	0.048455	0.034250	0.099399	0.001016	0.000998
<b>*</b> •	(0.063135)	(0.068835)	(0.109913)	(0.000926)	(0.000938)
LnAssets		-0.123611**	-0.10/219*	-0.012902**	-0.011513*
		(0.056382)	(0.063864)	(0.005897)	(0.005968)
Tobinq		0.000239		0.000064	0.000063
		(0.008304)		(0.000139)	(0.000141)
ROA		0.186572***		0.477554***	0.475325***
		(0.065695)		(0.069484)	(0.070360)
Leverage			0.025396	-0.030568	-0.018523
			(0.030247)	(0.028755)	(0.029100)
CashAssets			-0.144366***	0.005586	0.028638
			(0.045847)	(0.037534)	(0.037942)
RDcapital				-0.182238	-0.168519
-				(0.212909)	(0.215659)
CapexAssets				-0.171278	-0.079289
•				(0.121893)	(0.123113)
AcqAssets				-0.018974	-0.021051
1				(0.033085)	(0.033420)
PPEGrowtht				-0.002276*	
				(0.001279)	
PPEGrowtht1					-0.000192**
					(0.000087)
cons	-0 151333	-1 775061	-1 417529	0 139879***	0.127508***
_00115	(0.220168)	(1 404468)	(1 559544)	(0.017494)	(0.017661)
Obs	9731	9100	7888	4575	4580
R-squared	0.000068	0.001751	0.002481	0.015284	0.015411
Firm Dummy	VES	VES	VES	VES	VES
Vear Dummy	VES	VES	VES	VES	VES
i cai Dunniny	110	11.0	11.0	1120	11.0

Γable 10-d: Regression results	(OPMt+1 as de	pendent variable, Av	gNum as cross-ownershi	p variable)	
--------------------------------	---------------	----------------------	------------------------	-------------	--

OPM <sub>t+1</sub>	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	0.082469**	0.083437**	0.094104**	-0.002999	-0.003908
	(0.032505)	(0.035453)	(0.039842)	(0.032133)	(0.032554)
LnAssets		-0.012186**	-0.010932*	-0.012024**	-0.010645*
		(0.005596)	(0.006307)	(0.005848)	(0.005919)
Tobinq		-0.000284		0.000067	0.000067
*		(0.008304)		(0.000139)	(0.000141)
ROA		0.180080***		0.477217***	0.474884***
		(0.065725)		(0.069564)	(0.070443)
Leverage			0.019729	-0.030179	-0.018116
			(0.030297)	(0.028770)	(0.029115)
CashAssets			-0.143402***	0.006557	0.029574
			(0.045769)	(0.037531)	(0.037939)
RDcapital				-0.183334	-0.169619
				(0.212942)	(0.215689)
CapexAssets				-0.174004	-0.082092
				(0.121934)	(0.123153)
AcqAssets				-0.019968	-0.022023
DDE Contra				(0.033078)	(0.033412)
PPEGrowtht				-0.0022/2*	
DDECth +1				(0.0012/9)	0.000102**
PPEGrowtht1					-0.000192***
6005	0.530740**	2 180454	1 751545	0 130850***	0.127546***
_cons	(0.267069)	(1 412967)	(1 563565)	(0.017591)	(0.017760)
Obs	9732	9101	7888	4575	4580
B-squared	0.000746	0.002409	0.003163	0.014977	0.015125
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES
	110	110	110	110	1.10

## 3.7. Robustness checks

Firstly, we run the same regressions as those displayed in TABLE 9-a/9-t but recalculating the cross-ownership measures by using 3% instead of 5% as percentage threshold to define a block. Results are shown in TABLE 11-a/11-t and, in terms of statistical significance, we find the same patterns as those recognized for the previous case.

Second, we re-run the regressions by taking into consideration cross-ownership not simply by institutional investors but rather by all investors, keeping the 5% minimum stake for a block. Results are reported in **TABLE 12-a/12-t** for market share growth and **TABLE 13-a/13-e** for operating profit margin. Overall, statistical significance of regressions coefficients is the same as the ones for the baseline regressions, which means that the phenomenon of institutional investors' common ownership can be, after all, explained by the same variables as those needed to explain cross-ownership by every type of investor.

Third, in order to prove the reliability of the panel models employed even for values far from mean and median values, we use quantile regressions in order to estimate the 90<sup>th</sup> percentile of the response variable. Results are reported in **TABLE 14-a/14-t**. In these cases, the coefficient for the measures of cross-ownership is always negative and is significant at least at 10% level in the majority of the regressions, even though significance tends to weaken once we include more and more explanatory variables. For instance, in **TABLE 14-a**, once we introduce LnAssets, Leverage and CashAssets as independent variables, the statistical significance of the cross-ownership measure drops to 5%. If instead we use LnAssets, Tobinq and ROA, CrossDummy will be significant only at 10% level.

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)	(6)
C D	0.000070	0.000454	0.000101	0.000204	0.000.405	
CrossDummy	0.000069	0.000154	0.000124	0.000394	0.000405	
T A .	(0.000240)	(0.000259)	(0.000300)	(0.000507)	(0.000506)	
LnAssets		-0.000465**	-0.000425*	-0.000/90	-0.000/81	
<b>75</b> 1 1		(0.000225)	(0.000254)	(0.000485)	(0.000484)	
Tobinq		-0.000001		0.000000	0.000000	
		(0.000003)		(0.000012)	(0.000012)	
ROA		0.006916***		0.012605**	0.012739**	
		(0.002629)		(0.005725)	(0.005722)	
Leverage			-0.000907	-0.001543	-0.001523	
			(0.001197)	(0.002365)	(0.002363)	
CashAssets			0.000717	0.000064	0.000082	
			(0.001832)	(0.003106)	(0.003096)	
RDcapital				-0.022195	-0.022233	
				(0.017483)	(0.017474)	
CapexAssets				-0.011023	-0.010954	
-				(0.010067)	(0.010011)	
AcqAssets				0.002931	0.003108	
*				(0.002722)	(0.002713)	
PPEGrowtht				0.000106	( )	
				(0.000105)		
PPEGrowtht1					0.000001	
					(0.000007)	
BlockDummy					(0100000)	0.000006
Diotilis annig						(0.000276)
cons	-0.000037	0.000525	0.000880	0.001364	0.001326	0.000005
_cons	(0.000179)	(0.000572)	(0.000633)	(0.001364	(0.001320	(0.000232)
Obs	(0.000177)	8946	7762	(0.001402)	(0.001407)	0572
P squared	0.000010	0.001402	0.000503	0.003524	0.003258	0.000000
Eiro Dummu	VES	0.001492 VES	VES	VES	VES	VES
Voor Dummy	VES	VES	VES	VES	VES	VES
i cai Duinniy	1 5	1 5	1 63	1 5	1 0.0	1 63

 Table 11-a: Regression results (LnMktShareGrowt+1 as dependent variable, CrossDummy as cross-ownership variable)

 Table 11-b: Regression results (MktShareGrowt+1 as dependent variable, CrossDummy as cross-ownership variable)

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	0.000080	0.000169	0.000140	0.000422	0.000433	
	(0.000276)	(0.000297)	(0.000346)	(0.000591)	(0.000591)	
LnAssets		-0.000482*	-0.000441	-0.000849	-0.000840	
		(0.000259)	(0.000292)	(0.000566)	(0.000565)	
Tobing		-0.000001		-0.000000	-0.000000	
•		(0.000004)		(0.000014)	(0.000014)	
ROA		0.007243**		0.013366**	0.013506**	
		(0.003023)		(0.006682)	(0.006678)	
Leverage		. ,	-0.000963	-0.001665	-0.001643	
0			(0.001379)	(0.002761)	(0.002758)	
CashAssets			0.000761	0.000026	0.000047	
			(0.002111)	(0.003626)	(0.003614)	
RDcapital			· · · · ·	-0.023580	-0.023622	
1				(0.020405)	(0.020394)	
CapexAssets				-0.012536	-0.012453	
I				(0.011749)	(0.011684)	
AcqAssets				0.002782	0.002968	
1				(0.003177)	(0.003167)	
PPEGrowtht				0.000111		
				(0.000123)		
PPEGrowtht1					0.000001	
					(0.000008)	
BlockDummy					()	0.000010
· · · · · · · · · · · · · · · · · · ·						(0.000317)
cons	-0.000051	0.000528	0.000904	0.001516	0.001475	-0.000005
	(0.000206)	(0.000658)	(0.000730)	(0.001715)	(0.001712)	(0.000266)
Obs.	9572	8946	7762	4503	4508	9572
R-squared	0.000010	0.001231	0.000491	0.002880	0.002666	0.000000
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)	(6)
Carron	0.000180	0.000173	0.000020	0.000225	0.000224	
CrossDummy	-0.000180	(0.000165	(0.000069	-0.000325	-0.000324	
LnAssets	(0.000319)	0.002837***	0.000393)	0.000047)	0.000047)	
Lintssets		(0.002837	(0.0028751)	-0.003373***	-0.003371***	
Tobing		0.00000000	(0.000331)	0.000000)	0.000000)	
Tobinq		(0.000001)		(0.000007	(0.000007	
ROA		0.000180**		0.010803	0.010822	
ROM		(0.003697)		(0.007468)	(0.007465)	
Leverage		(0.005077)	0.000065	0.000935	0.000939	
Levelage			(0.001576)	(0.000703)	(0.003091)	
CashAssets			0.001570)	-0.001151	-0.001150	
Casin issets			(0.001362	(0.004094)	(0.004091)	
<b>BD</b> capital			(0.002451)	-0.048840**	-0.048792**	
Ribeapitai				(0.023374)	(0.023363)	
CapexAssets				-0.024337*	-0.024258*	
Capeziissets				(0.024337	(0.012785)	
AcaAssets				-0.000051	0.000018	
riequisseus				(0.003502)	(0.003488)	
PPEGrowtht				0.000035	(0.005100)	
11 Horowald				(0.000159)		
PPEGrowtht1				(0.000135))	0.000000	
11 Eolowulti					(0.000009)	
BlockDummy					(0.000000)	-0.000148
DioekDunning						(0.000364)
cons	-0.000032	0.005665***	0.005148***	0.007958***	0.007943***	-0.000035
	(0.000234)	(0.000779)	(0.000856)	(0.001942)	(0.001940)	(0.000304)
Obs	8090	7580	6550	3850	3854	8090
R-squared	0.000045	0.013667	0.012319	0.010678	0.010660	0.000023
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES
	- 110	- 110	- 110	- 110		

 Table 11-c: Regression results (LnMktShareGrowt+3 as dependent variable, CrossDummy as cross-ownership variable)

 Table 11-d: Regression results (MktShareGrowt+3 as dependent variable, CrossDummy as cross-ownership variable)

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	-0.000185	0.000177	0.000084	-0.000351	-0.000350	
	(0.000363)	(0.000388)	(0.000452)	(0.000750)	(0.000750)	
LnAssets		-0.002996***	-0.003047***	-0.003889***	-0.003884***	
		(0.000352)	(0.000401)	(0.000765)	(0.000765)	
Tobinq		-0.000002		-0.000008	-0.000008	
		(0.000005)		(0.000016)	(0.000016)	
ROA		0.009134**		0.010460	0.010481	
		(0.004220)		(0.008659)	(0.008654)	
Leverage			0.000152	0.001172	0.001176	
			(0.001803)	(0.003586)	(0.003584)	
CashAssets			0.001756	-0.001212	-0.001212	
			(0.002804)	(0.004747)	(0.004743)	
RDcapital				-0.053206**	-0.053153**	
				(0.027099)	(0.027086)	
CapexAssets				-0.027783*	-0.027696*	
				(0.014831)	(0.014822)	
AcqAssets				-0.000497	-0.000420	
				(0.004060)	(0.004043)	
PPEGrowtht				0.000040		
				(0.000184)		
PPEGrowtht1					0.000000	
					(0.000010)	
BlockDummy						-0.000162
						(0.000415)
_cons	-0.000057	0.005997***	0.005399***	0.008771***	0.008756***	-0.000052
	(0.000267)	(0.000890)	(0.000980)	(0.002251)	(0.002250)	(0.000346)
Obs.	8090	7580	6550	3850	3854	8090
R-squared	0.000037	0.011624	0.010595	0.009333	0.009315	0.000021
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)	
NumConnected	0.000000	0.000003	0.000002	0.000003	0.000003	
	(0.000007)	(0.000008)	(0.000010)	(0.000017)	(0.000017)	
LnAssets		-0.000458**	-0.000414	-0.000752	-0.000742	
		(0.000224)	(0.000253)	(0.000483)	(0.000483)	
Tobinq		-0.000001		0.000000	0.000000	
_		(0.000003)		(0.000012)	(0.000012)	
ROA		0.006916***		0.012659**	0.012797**	
		(0.002629)		(0.005726)	(0.005722)	
Leverage			-0.000888	-0.001562	-0.001542	
			(0.001199)	(0.002366)	(0.002364)	
CashAssets			0.000721	0.000062	0.000084	
			(0.001837)	(0.003113)	(0.003103)	
RDcapital				-0.022486	-0.022533	
				(0.017481)	(0.017471)	
CapexAssets				-0.011253	-0.011185	
				(0.010066)	(0.010010)	
AcqAssets				0.002868	0.003047	
				(0.002722)	(0.002713)	
PPEGrowtht				0.000108		
				(0.000105)		
PPEGrowtht1					0.000001	
					(0.000007)	
_cons	0.000003	0.000566	0.000916	0.001546	0.001512	
	(0.000126)	(0.000565)	(0.000626)	(0.001454)	(0.001451)	
Obs.	9572	8946	7762	4503	4508	
R-squared	0.000000	0.001472	0.000573	0.003373	0.003099	
Firm Dummy	YES	YES	YES	YES	YES	
Year Dummy	YES	YES	YES	YES	YES	

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000001	0.000004	0.000002	0.000003	0.000003
	(0.000008)	(0.000009)	(0.000012)	(0.000020)	(0.000020)
LnAssets		-0.000474*	-0.000430	-0.000808	-0.000797
		(0.000258)	(0.000291)	(0.000564)	(0.000563)
Tobinq		-0.000001		0.000000	0.000000
		(0.000004)		(0.000014)	(0.000014)
ROA		0.007244**		0.013425**	0.013567**
		(0.003023)		(0.006683)	(0.006678)
Leverage		. ,	-0.000941	-0.001686	-0.001664
8			(0.001381)	(0.002762)	(0.002758)
CashAssets			0.000766	0.000024	0.000049
			(0.002117)	(0.003634)	(0.003622)
RDcapital				-0.023892	-0.023944
				(0.020402)	(0.020391)
CapexAssets				-0.012783	-0.012700
				(0.011748)	(0.011683)
AcqAssets				0.002715	0.002902
1				(0.003176)	(0.003166)
PPEGrowtht				0.000113	
				(0.000123)	
PPEGrowtht1					0.000001
					(0.000008)
cons	-0.000005	0.000573	0.000945	0.001711	0.001675
	(0.000145)	(0.000649)	(0.000721)	(0.001697)	(0.001694)
Obs.	9572	8946	7762	4503	4508
R-squared	0.000001	0.001212	0.000472	0.002752	0.002532
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	VES	VES	VES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000002	0.000014	0.000002	-0.000012	-0.000012
	(0.000010)	(0.000011)	(0.000014)	(0.000023)	(0.000023)
LnAssets	. , ,	-0.002848***	-0.002873***	-0.003593***	-0.003588***
		(0.000308)	(0.000349)	(0.000657)	(0.000656)
Tobinq		-0.000002		-0.000007	-0.000007
_		(0.000004)		(0.000014)	(0.000014)
ROA		0.009143**		0.010674	0.010693
		(0.003696)		(0.007470)	(0.007466)
Leverage			0.000084	0.000922	0.000925
			(0.001578)	(0.003094)	(0.003092)
CashAssets			0.001545	-0.001053	-0.001053
			(0.002457)	(0.004102)	(0.004098)
RDcapital				-0.048705**	-0.048660**
				(0.023371)	(0.023360)
CapexAssets				-0.024458*	-0.024382*
				(0.012803)	(0.012796)
AcqAssets				-0.000018	0.000050
				(0.003500)	(0.003486)
PPEGrowtht				0.000035	
				(0.000159)	
PPEGrowtht1					0.000000
					(0.000009)
_cons	-0.000179	0.005622***	0.005155***	0.007927***	0.007914***
	(0.000172)	(0.000772)	(0.000850)	(0.001932)	(0.001931)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000006	0.013849	0.012319	0.010679	0.010662
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

Table 11-g: Regression results	(LnMktShareGrowt	+3 as dependent	variable, NumCor	nnected as cross-o	wnership variable)
LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)

 Table 11-h: Regression results (MktShareGrowt+3 as dependent variable, NumConnected as cross-ownership variable)

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000002	0.000014	0.000003	-0.000013	-0.000013
	(0.000012)	(0.000013)	(0.000016)	(0.000027)	(0.000027)
LnAssets		-0.003007***	-0.003043***	-0.003907***	-0.003902***
		(0.000351)	(0.000400)	(0.000762)	(0.000761)
Tobinq		-0.000002		-0.000008	-0.000008
_		(0.000005)		(0.000016)	(0.000016)
ROA		0.009098**		0.010318	0.010339
		(0.004219)		(0.008660)	(0.008656)
Leverage			0.000173	0.001157	0.001161
			(0.001805)	(0.003587)	(0.003585)
CashAssets			0.001741	-0.001102	-0.001103
			(0.002810)	(0.004755)	(0.004751)
RDcapital				-0.053062*	-0.053012*
-				(0.027095)	(0.027082)
CapexAssets				-0.027926*	-0.027844*
-				(0.014843)	(0.014835)
AcqAssets				-0.000463	-0.000386
*				(0.004058)	(0.004041)
PPEGrowtht				0.000039	
				(0.000184)	
PPEGrowtht1				. ,	0.000000
					(0.000010)
_cons	-0.000206	0.005956***	0.005410***	0.008742***	0.008729***
	(0.000196)	(0.000881)	(0.000972)	(0.002240)	(0.002238)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000004	0.011771	0.010594	0.009338	0.009321
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000005	0.000016	-0.000011	0.000005	0.000005
	(0.000072)	(0.000077)	(0.000088)	(0.000143)	(0.000143)
LnAssets		-0.000449**	-0.000406	-0.000745	-0.000735
		(0.000223)	(0.000251)	(0.000481)	(0.000481)
Tobinq		-0.000001		-0.000000	-0.000000
		(0.000003)		(0.000012)	(0.000012)
ROA		0.006940***		0.012653**	0.012791**
		(0.002629)		(0.005729)	(0.005725)
Leverage			-0.000901	-0.001572	-0.001552
			(0.001197)	(0.002366)	(0.002364)
CashAssets			0.000764	0.000097	0.000119
			(0.001833)	(0.003107)	(0.003097)
RDcapital				-0.022484	-0.022531
				(0.017481)	(0.017472)
CapexAssets				-0.011296	-0.011226
				(0.010068)	(0.010012)
AcqAssets				0.002856	0.003035
				(0.002721)	(0.002713)
PPEGrowtht				0.000108	
				(0.000105)	
PPEGrowtht1					0.000001
					(0.000007)
_cons	0.000019	0.000561	0.000948	0.001565	0.001530
	(0.000164)	(0.000579)	(0.000638)	(0.001484)	(0.001481)
Obs.	9572	8946	7762	4503	4508
R-squared	0.000001	0.001452	0.000570	0.003364	0.003091
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

Table 11-i: Regression results	(LnMktShareGrowt+1 as de	ependent variable, N	lumCross as cross-ownership	o variable)	)

NumCross	-0.000005	0.000015	-0.000012	0.000002	0.000002
	(0.000082)	(0.000089)	(0.000101)	(0.000167)	(0.000167)
LnAssets		-0.000465*	-0.000422	-0.000800	-0.000789
		(0.000257)	(0.000289)	(0.000562)	(0.000561)
Tobinq		-0.000001		-0.000000	-0.000000
-		(0.000004)		(0.000014)	(0.000014)
ROA		0.007269**		0.013413**	0.013557**
		(0.003023)		(0.006686)	(0.006682)
Leverage			-0.000956	-0.001698	-0.001676
			(0.001379)	(0.002762)	(0.002758)
CashAssets			0.000815	0.000063	0.000088
			(0.002111)	(0.003627)	(0.003615)
RDcapital				-0.023893	-0.023944
				(0.020402)	(0.020391)
CapexAssets				-0.012836	-0.012753
				(0.011750)	(0.011685)
AcqAssets				0.002701	0.002888
				(0.003176)	(0.003166)
PPEGrowtht				0.000113	

Table 11-j: Regression results (MktShareGrowt+1 as dependent variable, NumCross as cross-ownership variable)MktShareGrowt1(1)(2)(3)(4)(5)

				(0.011750)
AcqAssets				0.002701
•				(0.003176)
PPEGrowtht				0.000113
PPEGrowtht1				(0.000123)
_cons	0.000014	0.000571	0.000980	0.001739
	(0.000188)	(0.000666)	(0.000735)	(0.001732)
Obs.	9572	8946	7762	4503

0.000001 YES

YES

R-squared Firm Dummy Year Dummy 0.001195 YES

YES

0.000001 (0.000008) 0.001702

(0.001728)

4508

4508 0.002525 YES YES

0.002745 YES

YES

0.000469

YES

YES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000044	0.000004	-0.000051	-0.000190	-0.000190
	(0.000096)	(0.000103)	(0.000116)	(0.000184)	(0.000184)
LnAssets	(******)	-0.002821***	-0.002858***	-0.003593***	-0.003588***
		(0.000307)	(0.000348)	(0.000656)	(0.000655)
Tobing		-0.000001	( )	-0.000007	-0.000007
1		(0.000004)		(0.000014)	(0.000014)
ROA		0.009215**		0.010504	0.010527
		(0.003696)		(0.007471)	(0.007467)
Leverage		· · · · ·	0.000068	0.000897	0.000900
0			(0.001576)	(0.003093)	(0.003091)
CashAssets			0.001622	-0.001135	-0.001133
			(0.002450)	(0.004093)	(0.004090)
RDcapital			. ,	-0.048807**	-0.048761**
*				(0.023368)	(0.023357)
CapexAssets				-0.024753*	-0.024673*
*				(0.012798)	(0.012790)
AcqAssets				-0.000096	-0.000029
_				(0.003501)	(0.003487)
PPEGrowtht				0.000035	
				(0.000159)	
PPEGrowtht1					0.000000
					(0.000009)
_cons	-0.000064	0.005726***	0.005259***	0.008232***	0.008218***
	(0.000217)	(0.000787)	(0.000863)	(0.001960)	(0.001959)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000029	0.013633	0.012346	0.010929	0.010912
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

Tuble II in Regression results (Eminibility of the dependent variable)	Table 11-k: Regression results (LnMk	tShareGrowt+3 as dependent variable	, NumCross as cross-ownership variable)
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MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000047	0.000003	-0.000052	-0.000202	-0.000202
	(0.000110)	(0.000117)	(0.000133)	(0.000213)	(0.000213)
LnAssets		-0.002978***	-0.003027***	-0.003908***	-0.003903***
		(0.000350)	(0.000398)	(0.000760)	(0.000760)
Tobinq		-0.000002		-0.000008	-0.000008
_		(0.000005)		(0.000016)	(0.000016)
ROA		0.009172**		0.010141	0.010166
		(0.004219)		(0.008662)	(0.008657)
Leverage			0.000156	0.001133	0.001136
			(0.001803)	(0.003586)	(0.003584)
CashAssets			0.001821	-0.001195	-0.001195
			(0.002803)	(0.004746)	(0.004742)
RDcapital			. ,	-0.053168**	-0.053117**
				(0.027093)	(0.027080)
CapexAssets				-0.028224*	-0.028136*
-				(0.014838)	(0.014829)
AcqAssets				-0.000545	-0.000469
<b>^</b>				(0.004059)	(0.004042)
PPEGrowtht				0.000039	. ,
				(0.000184)	
PPEGrowtht1				. ,	0.000000
					(0.000010)
_cons	-0.000087	0.006066***	0.005518***	0.009062***	0.009046***
	(0.000247)	(0.000899)	(0.000987)	(0.002273)	(0.002271)

7580

0.011593

YES

YES

6550

0.010616 YES

YES

3850

0.009544 YES

YES

3854

0.009527 YES YES

8090

0.000025 YES

YES

Obs. R-squared

Firm Dummy

Year Dummy

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000005	0.000011	0.000023	0.000041	0.000041
	(0.000016)	(0.000017)	(0.000027)	(0.000046)	(0.000046)
LnAssets		-0.000468**	-0.000446*	-0.000813*	-0.000804*
		(0.000226)	(0.000255)	(0.000487)	(0.000487)
Tobinq		-0.000001		0.000000	0.000000
		(0.000003)		(0.000012)	(0.000012)
ROA		0.006908***		0.012535**	0.012672**
		(0.002629)		(0.005726)	(0.005723)
Leverage			-0.000865	-0.001477	-0.001457
Ũ			(0.001198)	(0.002368)	(0.002365)
CashAssets			0.000639	-0.000021	-0.000002
			(0.001835)	(0.003109)	(0.003099)
RDcapital				-0.022440	-0.022484
1				(0.017479)	(0.017470)
CapexAssets				-0.011014	-0.010949
L.				(0.010065)	(0.010010)
AcqAssets				0.002923	0.003101
1				(0.002721)	(0.002713)
PPEGrowtht				0.000107	( )
				(0.000105)	
PPEGrowtht1					0.000001
					(0.000007)
cons	-0.000013	0.000589	0.000915	0.001529	0.001495
	(0.000106)	(0.000562)	(0.000622)	(0.001445)	(0.001442)
Obs.	9572	8946	7762	4503	4508
R-squared	0.000012	0.001498	0.000671	0.003569	0.003299
Firm Dummy	YES	YES	YES	YES	YES
Vear Dummy	VES	VES	VES	VES	VES

Table 11-n: Regression results	(MktShareGrowt+1	as dependent va	riable, AvgNum as	cross-ownership	variable)
MktShareGrowt1	(1)	(2)	(3)	(4)	(5)

	(1)	(-)	(3)	( )	(*)
AvgNum	0.000006	0.000012	0.000025	0.000044	0.000044
0	(0.000018)	(0.000020)	(0.000031)	(0.000054)	(0.000054)
LnAssets	· · · · ·	-0.000486*	-0.000465	-0.000874	-0.000864
		(0.000259)	(0.000294)	(0.000569)	(0.000568)
Tobing		-0.000001	· · · · ·	0.000000	0.000000
1		(0.000004)		(0.000014)	(0.000014)
ROA		0.007234**		0.013291**	0.013433**
		(0.003023)		(0.006683)	(0.006679)
Leverage		()	-0.000916	-0.001594	-0.001572
8			(0.001380)	(0.002763)	(0.002760)
CashAssets			0.000676	-0.000066	-0.000044
			(0.002114)	(0.003629)	(0.003617)
RDcapital				-0.023843	-0.023891
F				(0.020400)	(0.020389)
CapexAssets				-0.012524	-0.012446
				(0.011748)	(0.011682)
AcqAssets				0.002774	0.002961
1				(0.003176)	(0.003166)
PPEG <b>r</b> owtht				0.000112	(0.000100)
				(0.000123)	
PPEGrowtht1					0.000001
					(0.000008)
cons	-0.000023	0.000599	0.000944	0.001692	0.001656
	(0.000121)	(0.000646)	(0.000717)	(0.001686)	(0.001683)
Obs.	9572	8946	7762	4503	4508
R-squared	0.000012	0.001237	0.000561	0.002920	0.002703
Firm Dummy	YES	YES	YES	YES	YES
Vear Dummy	VES	VES	VEC	VTC	VDC

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000009	0.000041	0.000035	-0.000006	-0.000006
	(0.000025)	(0.000027)	(0.000042)	(0.000069)	(0.000069)
LnAssets		-0.002870***	-0.002907***	-0.003606***	-0.003602***
		(0.000309)	(0.000351)	(0.000661)	(0.000661)
Tobing		-0.000001	. ,	-0.000007	-0.000007
*		(0.000004)		(0.000014)	(0.000014)
ROA		0.009132**		0.010768**	0.010788**
		(0.003696)		(0.000747)	(0.000747)
Leverage			0.000121	0.000947	0.000951
0			(0.001577)	(0.003098)	(0.003096)
CashAssets			0.001421	-0.001162	-0.001162
			(0.002456)	(0.004101)	(0.004097)
RDcapital				-0.048648**	-0.048602**
<b>I</b>				(0.023372)	(0.023360)
CapexAssets				-0.024155*	-0.024077*
				(0.012797)	(0.012790)
AcqAssets				0.000009	0.000077
				(0.003500)	(0.003486)
PPEGrowtht				0.000035	(01000 100)
11 Bolowald				(0.000159)	
PPEGrowtht1				(0.000107)	0.000000
11 EGIOWURI					(0.000009)
cons	-0.000187	0.005684***	0.005128***	0.007802***	0.007788***
	(0.000146)	(0.000767)	(0.000844)	(0.001918)	(0.001916)
Obs	8090	7580	6550	3850	3854
R-squared	0.000018	0.013980	0.012432	0.010602	0.010584
Firm Dummy	VES	VES	VES	VES	VES
Voor Dummy	VES	VES	VEC	VEC	VES

Table 11-0: Regression results	(LnMktShareGrowt+3 as de	pendent variable, AvgNur	n as cross-ownership variable)

Table 11 p. Pograssion results	(MittSharoCrowt+3 as dopondont	variable AveNum as a	ross ownorship variable)
Table II-D. Regression results	INIKISHAICOIUWI I J AS UCDEHUCH	, vanabic, Avginum as c	1088-0WHEISHID VAHADICI

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000008	0.000042	0.000034	-0.000013	-0.000013
0	(0.000028)	(0.000030)	(0.000048)	(0.000081)	(0.000081)
LnAssets		-0.003029***	-0.003077***	-0.003914***	-0.003909***
		(0.000352)	(0.000402)	(0.000767)	(0.000766)
Tobinq		-0.000002		-0.000008	-0.000008
-		(0.000005)		(0.000016)	(0.000016)
ROA		0.009087**		0.010431**	0.010452**
		(0.004219)		(0.000866)	(0.000866)
Leverage			0.000208	0.001169	0.001173
			(0.001804)	(0.003591)	(0.003589)
CashAssets			0.001621	-0.001201	-0.001202
			(0.002810)	(0.004754)	(0.004750)
RDcapital				-0.053009*	-0.052959*
				(0.027096)	(0.027083)
CapexAssets				-0.027641*	-0.027556*
				(0.014836)	(0.014828)
AcqAssets				-0.000434	-0.000357
				(0.004058)	(0.004041)
PPEGrowtht				0.000040	
				(0.000184)	
PPEGrowtht1					0.000000
	0.000040	0.00.0004	0.005305444	0.00045	(0.000010)
_cons	-0.000213	0.006021***	0.005385***	0.008615***	0.008601***
	(0.000166)	(0.000876)	(0.000965)	(0.002223)	(0.002222)
Obs.	8090	/580	6550	3850	3854
K-squared	0.00012 XES	0.0118/1 VTS	0.010677	0.009273	0.009256
Firm Dummy	YES	YES	YES	YES	YES VES
i ear Dummy	165	185	1 ES	1ES	1ES

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.000672	-0.000345	-0.000639	-0.000449	-0.000446
	(0.001057)	(0.001137)	(0.001291)	(0.002070)	(0.002069)
LnAssets	· · · · ·	-0.000445**	-0.000401	-0.000741	-0.000731
		(0.000223)	(0.000251)	(0.000481)	(0.000481)
Tobinq		-0.000001	. ,	-0.000000	-0.000000
		(0.000003)		(0.000012)	(0.000012)
ROA		0.006911***		0.012592**	0.012729**
		(0.002630)		(0.005731)	(0.005728)
Leverage			-0.000873	-0.001573	-0.001553
			(0.001198)	(0.002365)	(0.002363)
CashAssets			0.000769	0.000089	0.000111
			(0.001830)	(0.003107)	(0.003097)
RDcapital				-0.022516	-0.022563
				(0.017481)	(0.017472)
CapexAssets				-0.011387	-0.011316
				(0.010067)	(0.010012)
AcqAssets				0.002841	0.003020
				(0.002721)	(0.002712)
PPEGrowtht				0.000108	
				(0.000105)	
PPEGrowtht1					0.000001
					(0.000007)
_cons	0.000086	0.000624	0.000984	0.001633	0.001599
	(0.000143)	(0.000574)	(0.000631)	(0.001468)	(0.001466)
Obs.	9572	8946	7762	4503	4508
R-squared	0.000048	0.001459	0.000603	0.003377	0.003102
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

Table 11-1. Regression results (Mikionaleonowi + 1 as dependent variable, 10talorosowii as cross-ownersind variable	Table 11-r: Regression results (	MktShareGrowt+1 as dependent variable.	, TotalCrossOwn as cross-ownership variable
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MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.000709	-0.000371	-0.000675	-0.000506	-0.000503
	(0.001215)	(0.001307)	(0.001487)	(0.002416)	(0.002414)
LnAssets		-0.000461*	-0.000416	-0.000796	-0.000785
		(0.000257)	(0.000289)	(0.000562)	(0.000561)
Tobinq		-0.000001		-0.000000	-0.000000
		(0.000004)		(0.000014)	(0.000014)
ROA		0.007237**		0.013349**	0.013492**
		(0.003024)		(0.006689)	(0.006685)
Leverage			-0.000926	-0.001697	-0.001675
			(0.001380)	(0.002761)	(0.002757)
CashAssets			0.000819	0.000052	0.000077
			(0.002109)	(0.003626)	(0.003614)
RDcapital				-0.023925	-0.023978
				(0.020402)	(0.020391)
CapexAssets				-0.012930	-0.012845
				(0.011750)	(0.011685)
AcqAssets				0.002686	0.002873
*				(0.003176)	(0.003166)
PPEGrowtht				0.000113	. ,
				(0.000123)	
PPEGrowtht1				. ,	0.000001
					(0.000008)
_cons	0.000084	0.000636	0.001017	0.001808	0.001771
	(0.000164)	(0.000660)	(0.000727)	(0.001714)	(0.001710)
Obs.	9572	8946	7762	4503	4508
R-squared	0.000040	0.001201	0.000497	0.002757	0.002536
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)	
TotalCrossOwn	-0.002184	-0.001628	-0.002351	-0.004075	-0.004075	•
	(0.001394)	(0.001488)	(0.001669)	(0.002593)	(0.002592)	
LnAssets		-0.002810***	-0.002844***	-0.003574***	-0.003569***	
		(0.000307)	(0.000348)	(0.000656)	(0.000655)	
Tobinq		-0.000001		-0.000007	-0.000007	
_		(0.000004)		(0.000014)	(0.000014)	
ROA		0.009136**		0.010208	0.010225	
		(0.003697)		(0.007474)	(0.007470)	
Leverage			0.000201	0.001039	0.001043	
			(0.001578)	(0.003092)	(0.003090)	
CashAssets			0.001602	-0.001361	-0.001358	
			(0.002448)	(0.004094)	(0.004090)	
RDcapital				-0.049006**	-0.048959**	
				(0.023364)	(0.023352)	
CapexAssets				-0.025017*	-0.024941*	
				(0.012793)	(0.012785)	
AcqAssets				-0.000111	-0.000044	
				(0.003500)	(0.003485)	
PPEGrowtht				0.000034		
				(0.000159)		
PPEGrowtht1					0.000000	
					(0.000009)	
_cons	0.000094	0.005895***	0.005375***	0.008308***	0.008294***	
	(0.000187)	(0.000/81)	(0.000853)	(0.001941)	(0.001939)	
Obs.	8090	/580	6550	3850	3854	
K-squared	0.000345	0.013810	0.012655	0.011363 NTEC	0.011345	
Firm Dummy	YES	YES	YES	YES	YES	
Year Dummy	YES	YES	YES	YES	YES	

Table 11-s: Regression results	(LnMktShareGrowt-	+3 as dependent v	variable, TotalCro	ssOwn as cross-ov	wnership variable)
L - Ml-tCl C + 2	(1)	(2)	(2)	(4)	(E)

Table 11-t: Regression results	(MktShareGrowt+3 as dej	pendent variable,	TotalCrossOwn as	s cross-ownershij	o variable)	)
MUCL C 12	(1)	$\langle 0 \rangle$	(2)	(4)	(5)	

	(4)	(3)	(4)	(5)
-0.002294	-0.001715	-0.002455	-0.004300	-0.004300
(0.001589)	(0.001699)	(0.001909)	(0.003006)	(0.003005)
	-0.002967***	-0.003012***	-0.003888***	-0.003883***
	(0.000350)	(0.000398)	(0.000760)	(0.000760)
	-0.000001	. ,	-0.000008	-0.000008
	(0.000005)		(0.000016)	(0.000016)
	0.009088**		0.009831	0.009850
	(0.004220)		(0.008665)	(0.008661)
	· · · · ·	0.000294	0.001283	0.001287
		(0.001806)	(0.003585)	(0.003583)
		0.001801	-0.001434	-0.001433
		(0.002801)	(0.004746)	(0.004743)
			-0.053375**	-0.053324**
			(0.027089)	(0.027075)
			-0.028495*	-0.028412*
			(0.014833)	(0.014824)
			-0.000559	-0.000484
			(0.004057)	(0.004041)
			0.000039	(0.000.01-)
			(0.000184)	
			(0.000101)	0.000000
				(0.000010)
0.000078	0.006241***	0.005639***	0.009137***	0.009122***
(0.000213)	(0.000891)	(0.000976)	(0.002250)	(0.002248)
8090	7580	6550	3850	3854
0.000293	0.011744	0.010874	0.009898	0.009881
YES	YES	YES	YES	YES
YES	YES	YES	YES	YES
	-0.002294 (0.001589) 0.000078 (0.000213) 8090 0.000293 YES YES	$\begin{array}{c cccc} -0.002294 & -0.001715 \\ (0.001589) & (0.001699) \\ -0.002967^{***} \\ (0.000350) \\ -0.000001 \\ (0.000005) \\ 0.009088^{**} \\ (0.004220) \\ \end{array}$	$\begin{array}{c cccccc} -0.002294 & -0.001715 & -0.002455 \\ (0.001589) & (0.001699) & (0.001909) \\ -0.002967^{***} & -0.003012^{***} \\ & (0.000350) & (0.000398) \\ -0.000001 & (0.000005) \\ & (0.000005) & (0.000294 \\ & (0.001806) \\ & 0.001801 \\ & (0.002801) \\ \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	-0.000154	-0.000073	-0.000039	-0.000035	-0.000033	
	(0.000211)	(0.000227)	(0.000262)	(0.000438)	(0.000438)	
LnAssets		-0.000441**	-0.000404	-0.000742	-0.000732	
		(0.000224)	(0.000252)	(0.000482)	(0.000482)	
Tobinq		-0.000001		-0.000000	-0.000000	
		(0.000003)		(0.000012)	(0.000012)	
ROA		0.006933***		0.012639**	0.012776**	
		(0.002629)		(0.005726)	(0.005723)	
Leverage			-0.000894	-0.001568	-0.001548	
, in the second s			(0.001198)	(0.002367)	(0.002364)	
CashAssets			0.000759	0.000101	0.000123	
			(0.001831)	(0.003106)	(0.003096)	
RDcapital			. ,	-0.022504	-0.022550	
				(0.017482)	(0.017473)	
CapexAssets				-0.011320	-0.011250	
1				(0.010062)	(0.010007)	
AcqAssets				0.002849	0.003027	
1				(0.002721)	(0.002713)	
PPEGrowtht				0.000108		
				(0.000105)		
PPEGrowtht1				(******)	0.000001	
					(0.000007)	
BlockDummy					(0.00000)	-0.000223
						(0.000330
cons	0.000086	0.000609	0.000940	0.001589	0.001554	0.000209
	(0.000130)	(0.000565)	(0.000625)	(0.001453)	(0.001450)	(0.000302
Obs.	9571	8945	7762	4503	4508	9571
R-squared	0.000063	0.001461	0.000571	0.003366	0.003092	0.000055
firm Dummy	YES	YES	YES	YES	YES	YES
Vear Dummy	VES	YES	YES	YES	VES	VES

#### Table 12-b: Regression results

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	-0.000152	-0.000066	-0.000033	-0.000034	-0.000032	
	(0.000242)	(0.000261)	(0.000301)	(0.000511)	(0.000511)	
LnAssets		-0.000458*	-0.000420	-0.000797	-0.000787	
		(0.000258)	(0.000291)	(0.000563)	(0.000563)	
Tobinq		-0.000001		-0.000000	-0.000000	
*		(0.000004)		(0.000014)	(0.000014)	
ROA		0.007262**		0.013403**	0.013547**	
		(0.003023)		(0.006683)	(0.006679)	
Leverage			-0.000950	-0.001692	-0.001671	
0			(0.001380)	(0.002762)	(0.002759)	
CashAssets			0.000807	0.000065	0.000090	
			(0.002109)	(0.003625)	(0.003614)	
RDcapital				-0.023909	-0.023960	
*				(0.020403)	(0.020392)	
CapexAssets				-0.012852	-0.012769	
*				(0.011744)	(0.011678)	
AcqAssets				0.002695	0.002882	
1				(0.003176)	(0.003166)	
PPEGrowtht				0.000113		
				(0.000123)		
PPEGrowtht1					0.000001	
					(0.000008)	
BlockDummy						-0.000226
,						(0.000380)
cons	0.000079	0.000617	0.000969	0.001755	0.001718	0.000202
-	(0.000149)	(0.000650)	(0.000720)	(0.001696)	(0.001693)	(0.000347)
Obs.	9571	8945	7762	4503	4508	9571
R-squared	0.000047	0.001199	0.000468	0.002747	0.002526	0.000042
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	VES

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	-0.000158	0.000122	0.000240	0.000162	0.000162	
	(0.000284)	(0.000304)	(0.000349)	(0.000570)	(0.000569)	
LnAssets		-0.002831***	-0.002890***	-0.003625***	-0.003620***	
		(0.000308)	(0.000349)	(0.000657)	(0.000656)	
Tobinq		-0.000001		-0.000007	-0.000007	
		(0.000004)		(0.000014)	(0.000014)	
ROA		0.009219**		0.010834**	0.010854**	
		(0.003696)		(0.000747)	(0.000747)	
Leverage			0.000030	0.000930	0.000934	
			(0.001577)	(0.003095)	(0.003093)	
CashAssets			0.001537	-0.001185	-0.001185	
			(0.002449)	(0.004094)	(0.004090)	
RDcapital				-0.048637**	-0.048591**	
-				(0.023371)	(0.023360)	
CapexAssets				-0.024050*	-0.023972*	
*				(0.012786)	(0.012779)	
AcqAssets				0.000043	0.000111	
*				(0.003502)	(0.003488)	
PPEGrowtht				0.000035		
				(0.000159)		
PPEGrowtht1				. ,	0.000000	
					(0.000009)	
BlockDummy					· · · · ·	-0.000230
						(0.000439
_cons	-0.000074	0.005697***	0.005114***	0.007728***	0.007714***	0.000056
	(0.000172)	(0.000772)	(0.000847)	(0.001926)	(0.001925)	(0.000399
Obs.	8090	7580	6550	3850	3854	8090
R-squared	0.000044	0.013656	0.012395	0.010625	0.010607	0.000041
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

#### Table 12-d: Regression results

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	-0.000143	0.000156	0.000279	0.000180	0.000180	
	(0.000323)	(0.000347)	(0.000399)	(0.000660)	(0.000660)	
LnAssets		-0.002991***	-0.003064***	-0.003942***	-0.003938***	
		(0.000352)	(0.000400)	(0.000761)	(0.000761)	
Tobinq		-0.000002		-0.000008	-0.000008	
		(0.000005)		(0.000016)	(0.000016)	
ROA		0.009177**		0.010496**	0.010517**	
		(0.004219)		(0.000866)	(0.000866)	
Leverage			0.000111	0.001167	0.001170	
			(0.001804)	(0.003588)	(0.003586)	
CashAssets			0.001728	-0.001249	-0.001250	
			(0.002802)	(0.004746)	(0.004742)	
RDcapital			. ,	-0.052986*	-0.052936*	
				(0.027096)	(0.027082)	
CapexAssets				-0.027472*	-0.027386*	
				(0.014824)	(0.014815)	
AcqAssets				-0.000395	-0.000318	
*				(0.004060)	(0.004043)	
PPEGrowtht				0.000040	· · · · ·	
				(0.000184)		
PPEGrowtht1				· · · ·	0.000000	
					(0.000010)	
BlockDummy					· · · · ·	-0.000199
						(0.000500)
_cons	-0.000110	0.006025***	0.005360***	0.008521***	0.008506***	-0.000004
	(0.000196)	(0.000881)	(0.000968)	(0.002233)	(0.002231)	(0.000454)
Obs.	8090	7580	6550	3850	3854	8090
R-squared	0.000027	0.011623	0.010673	0.009288	0.009271	0.000022
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumConnected	-0.000011	-0.000004	0.000000	0.000008	0.000008
	(0.000017)	(0.000019)	(0.000026)	(0.000046)	(0.000046)
LnAssets		-0.000443**	-0.000409	-0.000754	-0.000744
		(0.000225)	(0.000254)	(0.000484)	(0.000484)
Tobinq		-0.000001		-0.000000	-0.000000
		(0.000003)		(0.000012)	(0.000012)
ROA		0.006932***		0.012670**	0.012808**
		(0.002629)		(0.005727)	(0.005724)
Leverage		. ,	-0.000900	-0.001578	-0.001558
0			(0.001197)	(0.002365)	(0.002363)
CashAssets			0.000751	0.000084	0.000106
			(0.001834)	(0.003108)	(0.003098)
RDcapital				-0.022499	-0.022546
1				(0.017481)	(0.017472)
CapexAssets				-0.011258	-0.011188
1				(0.010065)	(0.010010)
AcqAssets				0.002864	0.003042
1				(0.002721)	(0.002712)
PPEGrowtht				0.000108	( )
				(0.000105)	
PPEGrowtht1					0.000001
					(0.000007)
cons	0.000042	0.000588	0.000930	0.001573	0.001539
	(0.000092)	(0.000562)	(0.000622)	(0.001444)	(0.001442)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000049	0.001452	0.000568	0.003372	0.003098
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	VES	VES	VES	VES	VES

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumConnected	-0.000011	-0.000003	0.000001	0.000008	0.000009
	(0.000020)	(0.000022)	(0.000030)	(0.000054)	(0.000054)
LnAssets		-0.000459*	-0.000425	-0.000810	-0.000800
		(0.000259)	(0.000293)	(0.000565)	(0.000565)
Tobinq		-0.000001		-0.000000	-0.000000
		(0.000004)		(0.000014)	(0.000014)
ROA		0.007261**		0.013436**	0.013579**
		(0.003023)		(0.006684)	(0.006680)
Leverage			-0.000954	-0.001702	-0.001681
			(0.001379)	(0.002761)	(0.002757)
CashAssets			0.000799	0.000048	0.000072
			(0.002112)	(0.003627)	(0.003615)
RDcapital				-0.023906	-0.023958
				(0.020402)	(0.020391)
CapexAssets				-0.012787	-0.012705
				(0.011747)	(0.011682)
AcqAssets				0.002710	0.002898
*				(0.003176)	(0.003165)
PPEGrowtht				0.000113	
				(0.000123)	
PPEGrowtht1				. ,	0.000001
					(0.000008)
_cons	0.000036	0.000597	0.000961	0.001739	0.001703
	(0.000106)	(0.000646)	(0.000716)	(0.001686)	(0.001683)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000038	0.001194	0.000467	0.002752	0.002531
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES
5					

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000001	0.000036	0.000010	0.000008	0.000008
T A .	(0.000027)	(0.000029)	(0.000038)	(0.000065)	(0.000065)
LnAssets		-0.002856***	-0.0028/8***	-0.003620***	-0.003616***
Tobing		0.000308)	(0.000350)	0.000058)	0.000037)
Tobliq		(0.000002)		(0.000014)	(0.000007
ROA		0.009302**		0.010801**	0.010821**
		(0.003697)		(0.000748)	(0.000747)
Leverage		(01000001))	0.000076	0.000960	0.000963
			(0.001576)	(0.003093)	(0.003091)
CashAssets			0.001535	-0.001198	-0.001198
			(0.002454)	(0.004096)	(0.004092)
RDcapital				-0.048643**	-0.048597**
-				(0.023372)	(0.023360)
CapexAssets				-0.024040*	-0.023961*
				(0.012796)	(0.012788)
AcqAssets				0.000014	0.000082
				(0.003500)	(0.003486)
PPEGrowtht				0.000035	
				(0.000159)	
PPEGrowtht1					0.000000
	0.000152	0.00571.0***	0.005177***	0.007700***	(0.000009)
_cons	-0.000155	$(0.005/18^{***})$	0.0051/6***	$(0.007/80^{***})$	$0.007766^{***}$
Obe	(0.000124)	(0.000767)	(0.000842)	(0.001915)	(0.001914)
B-squared	0.00000	0.013857	0.012326	0.010605	0.010587
Firm Dummy	YES	VES	VES	YES	VES
Vear Dummy	VES	VES	VES	VES	VES

#### Table 12-h: Regression results

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000001	0.000038	0.000012	0.000009	0.000009
	(0.000031)	(0.000033)	(0.000044)	(0.000076)	(0.000076)
LnAssets		-0.003016***	-0.003050***	-0.003938***	-0.003933***
		(0.000352)	(0.000401)	(0.000762)	(0.000762)
Tobinq		-0.000002		-0.000008	-0.000008
		(0.000005)		(0.000016)	(0.000016)
ROA		0.009264**		0.010459**	0.010481**
		(0.004220)		(0.000867)	(0.000866)
Leverage			0.000165	0.001200	0.001203
			(0.001803)	(0.003586)	(0.003584)
CashAssets			0.001725	-0.001264	-0.001265
			(0.002808)	(0.004748)	(0.004745)
RDcapital				-0.052993*	-0.052943*
				(0.027096)	(0.027083)
CapexAssets				-0.027460*	-0.027374*
				(0.014835)	(0.014826)
AcqAssets				-0.000428	-0.000351
				(0.004058)	(0.004041)
PPEGrowtht				0.000040	
				(0.000184)	
PPEGrowtht1					0.000000
					(0.000010)
_cons	-0.000183	0.006054***	0.005432***	0.008578***	0.008564***
	(0.000141)	(0.000875)	(0.000963)	(0.002220)	(0.002219)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000000	0.011788	0.010602	0.009270	0.009253
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000067	-0.000018	-0.000017	-0.000009	-0.000008
	(0.000110)	(0.000119)	(0.000134)	(0.000222)	(0.000222)
LnAssets		-0.000446**	-0.000405	-0.000744	-0.000733
		(0.000224)	(0.000252)	(0.000482)	(0.000481)
Tobinq		-0.000001		0.000000	0.000000
		(0.000003)		(0.000012)	(0.000012)
ROA		0.006918***		0.012637**	0.012775**
		(0.002631)		(0.005730)	(0.005727)
Leverage			-0.000896	-0.001571	-0.001551
			(0.001197)	(0.002367)	(0.002364)
CashAssets			0.000758	0.000099	0.000121
			(0.001831)	(0.003106)	(0.003096)
RDcapital				-0.022479	-0.022527
				(0.017482)	(0.017473)
CapexAssets				-0.011319	-0.011249
				(0.010065)	(0.010009)
AcqAssets				0.002853	0.003031
-				(0.002721)	(0.002712)
PPEGrowtht				0.000108	
				(0.000105)	
PPEGrowtht1					0.000001
					(0.000007)
_cons	0.000063	0.000599	0.000937	0.001582	0.001547
	(0.000117)	(0.000566)	(0.000624)	(0.001452)	(0.001450)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000043	0.001451	0.000570	0.003365	0.003091
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

Table 1	12-j:	Regression	results
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MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000067	-0.000016	-0.000016	-0.000009	-0.000008
	(0.000127)	(0.000137)	(0.000154)	(0.000260)	(0.000259)
LnAssets		-0.000462*	-0.000421	-0.000799	-0.000788
		(0.000258)	(0.000290)	(0.000562)	(0.000562)
Tobinq		-0.000001		-0.000000	-0.000000
		(0.000004)		(0.000014)	(0.000014)
ROA		0.007248**		0.013402**	0.013545**
		(0.003026)		(0.006688)	(0.006683)
Leverage			-0.000951	-0.001695	-0.001674
			(0.001380)	(0.002762)	(0.002759)
CashAssets			0.000806	0.000063	0.000088
			(0.002109)	(0.003625)	(0.003614)
RDcapital				-0.023886	-0.023938
				(0.020403)	(0.020392)
CapexAssets				-0.012852	-0.012769
				(0.011747)	(0.011682)
AcqAssets				0.002699	0.002886
-				(0.003175)	(0.003165)
PPEGrowtht				0.000113	
				(0.000123)	
PPEGrowtht1				. ,	0.000001
					(0.000008)
_cons	0.000057	0.000607	0.000967	0.001749	0.001712
	(0.000135)	(0.000650)	(0.000719)	(0.001695)	(0.001692)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000033	0.001193	0.000468	0.002746	0.002525
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES
-					

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000066	0.000069	0.000079	0.000014	0.000014
	(0.000148)	(0.000159)	(0.000178)	(0.000288)	(0.000288)
LnAssets		-0.002829***	-0.002878***	-0.003615***	-0.003610***
		(0.000307)	(0.000349)	(0.000656)	(0.000656)
Tobinq		-0.000002		-0.000007	-0.000007
		(0.000004)		(0.000014)	(0.000014)
ROA		0.009292**		0.010784**	0.010803**
		(0.003700)		(0.000748)	(0.000748)
Leverage			0.000048	0.000957	0.000960
-			(0.001577)	(0.003095)	(0.003093)
CashAssets			0.001558	-0.001180	-0.001180
			(0.002449)	(0.004094)	(0.004091)
RDcapital			· · · · ·	-0.048648**	-0.048602**
1				(0.023372)	(0.023361)
CapexAssets				-0.024084*	-0.024006*
1				(0.012795)	(0.012787)
AcaAssets				0.000012	0.000080
1				(0.003500)	(0.003486)
PPEG <b>r</b> owtht				0.000035	(0.000 .000)
				(0.000159)	
PPEGrowtht1				(0.000101)	0.000000
11 EGIOWARI					(0.000009)
cons	-0.000100	0.005694***	0.005141***	0.007780***	0.007766***
	(0.000154)	(0.000772)	(0.000845)	(0.001927)	(0.001925)
Obs	8090	7580	6550	3850	3854
B-squared	0.000028	0.013661	0.012348	0.010601	0.010583
Firm Dummy	VES	VES	VES	VES	VES
Voor Dummy	VES	VES	VES	VES	VES

Table 12-	: Regression	n results
M1 (C1	C 12	

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
N	0.0000.60	0.000000		0.00004.0	0.000010
NumCross	-0.000062	0.000080	0.000091	0.000013	0.000013
<b>T</b> . A	(0.000169)	(0.000181)	(0.000203)	(0.000334)	(0.000334)
LnAssets		-0.002988***	-0.003050***	-0.003931***	-0.00392/***
		(0.000351)	(0.000399)	(0.000761)	(0.000760)
Tobinq		-0.000002		-0.000008	-0.000008
		(0.000005)		(0.000016)	(0.000016)
ROA		0.009260**		0.010437**	0.010458**
		(0.004224)		(0.000868)	(0.000867)
Leverage			0.000133	0.001197	0.001200
			(0.001804)	(0.003588)	(0.003586)
CashAssets			0.001753	-0.001244	-0.001244
			(0.002802)	(0.004746)	(0.004743)
RDcapital				-0.052998*	-0.052947*
				(0.027097)	(0.027084)
CapexAssets				-0.027513*	-0.027427*
				(0.014834)	(0.014825)
AcqAssets				-0.000430	-0.000353
				(0.004058)	(0.004042)
PPEGrowtht				0.000040	
				(0.000184)	
PPEGrowtht1				. ,	0.000000
					(0.000010)
_cons	-0.000131	0.006026***	0.005392***	0.008580***	0.008566***
	(0.000176)	(0.000881)	(0.000967)	(0.002234)	(0.002232)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000019	0.011622	0.010624	0.009266	0.009249
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
AvgNum	-0.000010	-0.000002	0.000016	0.000030	0.000031
	(0.000026)	(0.000028)	(0.000044)	(0.000078)	(0.000078)
LnAssets		-0.000446**	-0.000423*	-0.000769	-0.000760
		(0.000225)	(0.000254)	(0.000485)	(0.000485)
Tobinq		-0.000001		-0.000000	-0.000000
		(0.000003)		(0.000012)	(0.000012)
ROA		0.006935***		0.012653**	0.012790**
		(0.002629)		(0.005725)	(0.005722)
Leverage			-0.000889	-0.001582	-0.001563
			(0.001197)	(0.002365)	(0.002363)
CashAssets			0.000720	0.000078	0.000099
			(0.001832)	(0.003107)	(0.003097)
RDcapital				-0.022418	-0.022463
				(0.017481)	(0.017472)
CapexAssets				-0.011215	-0.011147
				(0.010064)	(0.010008)
AcqAssets				0.002883	0.003061
				(0.002721)	(0.002713)
PPEGrowtht				0.000107	
				(0.000105)	
PPEGrowtht1					0.000001
					(0.000007)
_cons	0.000027	0.000589	0.000935	0.001576	0.001542
	(0.000090)	(0.000562)	(0.000622)	(0.001444)	(0.001442)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000017	0.001448	0.000586	0.003404	0.003131
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

#### Table 12-n: Regression results

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
AvgNum	-0.000010	-0.000001	0.000017	0.000032	0.000032
	(0.000030)	(0.000032)	(0.000051)	(0.000091)	(0.000091)
LnAssets		-0.000463*	-0.000440	-0.000826	-0.000816
		(0.000259)	(0.000293)	(0.000566)	(0.000566)
Tobinq		-0.000001		-0.000000	-0.000000
		(0.000004)		(0.000014)	(0.000014)
ROA		0.007263**		0.013417**	0.013561**
		(0.003024)		(0.006682)	(0.006678)
Leverage			-0.000943	-0.001707	-0.001686
			(0.001379)	(0.002761)	(0.002757)
CashAssets			0.000767	0.000041	0.000065
			(0.002111)	(0.003626)	(0.003614)
RDcapital				-0.023821	-0.023871
				(0.020403)	(0.020391)
CapexAssets				-0.012744	-0.012663
				(0.011745)	(0.011680)
AcqAssets				0.002730	0.002917
				(0.003176)	(0.003166)
PPEGrowtht				0.000112	
				(0.000123)	
PPEGrowtht1					0.000001
					(0.000008)
_cons	0.000020	0.000598	0.000966	0.001743	0.001707
	(0.000103)	(0.000647)	(0.000716)	(0.001685)	(0.001682)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000013	0.001191	0.000482	0.002777	0.002557
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES
LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
------------------	------------	--------------	--------------	--------------	--------------
AvgNum	0.000012	0.000062	0.000033	0.000038	0.000038
	(0.000041)	(0.000043)	(0.000068)	(0.000113)	(0.000113)
LnAssets		-0.002864***	-0.002890***	-0.003636***	-0.003632***
		(0.000308)	(0.000351)	(0.000659)	(0.000659)
Tobinq		-0.000001		-0.000007	-0.000007
		(0.000004)		(0.000014)	(0.000014)
ROA		0.009229**		0.010807**	0.010827**
		(0.003696)		(0.000747)	(0.000747)
Leverage			0.000083	0.000966	0.000969
-			(0.001576)	(0.003093)	(0.003091)
CashAssets			0.001512	-0.001220	-0.001220
			(0.002453)	(0.004095)	(0.004092)
RDcapital			. ,	-0.048633**	-0.048587**
*				(0.023371)	(0.023360)
CapexAssets				-0.024003*	-0.023924*
*				(0.012788)	(0.012781)
AcqAssets				0.000031	0.000099
1				(0.003501)	(0.003486)
PPEGrowtht				0.000035	,
				(0.000159)	
PPEGrowtht1				· · · ·	0.000000
					(0.000009)
cons	-0.000169	0.005737***	0.005177***	0.007775***	0.007762***
_	(0.000121)	(0.000767)	(0.000842)	(0.001914)	(0.001912)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000012	0.013935	0.012354	0.010635	0.010617
Firm Dummy	YES	YES	YES	YES	YES
Vear Dummy	YES	VES	VES	YES	VES

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000013	0.000065	0.000037	0.000041	0.000041
0	(0.000047)	(0.000049)	(0.000077)	(0.000131)	(0.000131)
LnAssets		-0.003024***	-0.003063***	-0.003955***	-0.003950***
		(0.000352)	(0.000402)	(0.000764)	(0.000763)
Tobing		-0.000002		-0.000008	-0.000008
*		(0.000005)		(0.000016)	(0.000016)
ROA		0.009187**		0.010465**	0.010487**
		(0.004219)		(0.000866)	(0.000865)
Leverage		. ,	0.000173	0.001206	0.001210
0			(0.001803)	(0.003586)	(0.003583)
CashAssets			0.001701	-0.001288	-0.001288
			(0.002806)	(0.004748)	(0.004744)
RDcapital				-0.052982*	-0.052932*
Ł				(0.027096)	(0.027082)
CapexAssets				-0.027422*	-0.027336*
*				(0.014826)	(0.014818)
AcqAssets				-0.000409	-0.000332
1				(0.004058)	(0.004042)
PPEGrowtht				0.000040	
				(0.000184)	
PPEGrowtht1				. ,	0.000000
					(0.000010)
_cons	-0.000199	0.006075***	0.005433***	0.008574***	0.008559***
	(0.000138)	(0.000875)	(0.000963)	(0.002219)	(0.002217)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000011	0.011854	0.010628	0.009295	0.009279
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.000534	-0.000243	-0.000014	-0.000545	-0.000524
	(0.000977)	(0.001086)	(0.001261)	(0.002263)	(0.002262)
LnAssets		-0.000445**	-0.000408	-0.000741	-0.000731
		(0.000224)	(0.000251)	(0.000481)	(0.000481)
Tobinq		-0.000001		0.000000	0.000000
		(0.000003)		(0.000012)	(0.000012)
ROA		0.006920***		0.012602**	0.012741*
		(0.002630)		(0.005728)	(0.005725)
Leverage			-0.000899	-0.001552	-0.001532
			(0.001199)	(0.002367)	(0.002365)
CashAssets			0.000753	0.000081	0.000104
			(0.001830)	(0.003107)	(0.003097)
RDcapital				-0.022437	-0.022487
				(0.017482)	(0.017473)
CapexAssets				-0.011365	-0.011294
_				(0.010064)	(0.010008)
AcqAssets				0.002847	0.003026
				(0.002721)	(0.002712)
PPEGrowtht				0.000108	
				(0.000105)	
PPEGrowtht1					0.000001
					(0.000007
_cons	0.000054	0.000602	0.000931	0.001616	0.001581
	(0.000112)	(0.000565)	(0.000624)	(0.001454)	(0.001451)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000035	0.001454	0.000568	0.003379	0.003104
Firm Dummy	YES	YES	YES	YES	YES
Zear Dummy	YES	YES	YES	YES	YES

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.000535	-0.000229	0.000000	-0.000550	-0.000527
	(0.001123)	(0.001249)	(0.001453)	(0.002641)	(0.002640)
LnAssets		-0.000461*	-0.000424	-0.000797	-0.000786
		(0.000257)	(0.000290)	(0.000562)	(0.000561)
Tobinq		-0.000001		0.000000	0.000000
		(0.000004)		(0.000014)	(0.000014)
ROA		0.007249**		0.013366**	0.013510**
		(0.003024)		(0.006686)	(0.006681)
Leverage			-0.000955	-0.001676	-0.001655
			(0.001381)	(0.002763)	(0.002760)
CashAssets			0.000802	0.000045	0.000071
			(0.002108)	(0.003627)	(0.003615)
RDcapital				-0.023843	-0.023898
				(0.020403)	(0.020392)
CapexAssets				-0.012899	-0.012813
				(0.011746)	(0.011680)
AcqAssets				0.002693	0.002881
				(0.003175)	(0.003165)
PPEGrowtht				0.000113	
				(0.000123)	
PPEGrowtht1				. ,	0.000001
					(0.000008)
_cons	0.000048	0.000611	0.000960	0.001784	0.001746
	(0.000128)	(0.000650)	(0.000719)	(0.001697)	(0.001694)
Obs.	9571	8945	7762	4503	4508
R-squared	0.000027	0.001195	0.000467	0.002757	0.002535
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES
5					

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.002058	-0.001160	-0.000408	-0.002963	-0.002960
	(0.001314)	(0.001450)	(0.001658)	(0.002891)	(0.002890)
LnAssets		-0.002804***	-0.002862***	-0.003597***	-0.003593***
		(0.000308)	(0.000348)	(0.000656)	(0.000655)
Tobinq		-0.000001		-0.000007	-0.000007
		(0.000004)		(0.000014)	(0.000014)
ROA		0.009142**		0.010395**	0.010411**
		(0.003697)		(0.000748)	(0.000747)
Leverage			0.000096	0.001106	0.001110
-			(0.001579)	(0.003095)	(0.003094)
CashAssets			0.001581	-0.001320	-0.001319
			(0.002449)	(0.004095)	(0.004092)
RDcapital			. ,	-0.048415**	-0.048370**
1				(0.023369)	(0.023357)
CapexAssets				-0.024460*	-0.024385*
1				(0.012787)	(0.012780)
AcqAssets				-0.000051	0.000017
1				(0.003500)	(0.003486)
PPEGrowtht				0.000035	
				(0.000159)	
PPEGrowtht1					0.000000
					(0.000009)
cons	0.000015	0.005790***	0.005194***	0.008025***	0.008012***
	(0.000148)	(0.000770)	(0.000845)	(0.001927)	(0.001925)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000344	0.013727	0.012324	0.010925	0.010906
Firm Dummy	YES	YES	YES	YES	YES
Vear Dummy	VES	VES	VES	VES	VES

Table	12-t:	Regression	results
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MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.002083	-0.001130	-0.000367	-0.003166	-0.003164
	(0.001498)	(0.001655)	(0.001897)	(0.003352)	(0.003351)
LnAssets		-0.002962***	-0.003032***	-0.003913***	-0.003908***
		(0.000351)	(0.000398)	(0.000760)	(0.000760)
Tobinq		-0.000001		-0.000008	-0.000008
		(0.000005)		(0.000016)	(0.000016)
ROA		0.009101**		0.010024**	0.010041**
		(0.004220)		(0.000867)	(0.000866)
Leverage			0.000181	0.001356	0.001360
			(0.001807)	(0.003589)	(0.003587)
CashAssets			0.001779	-0.001394	-0.001394
			(0.002801)	(0.004748)	(0.004744)
RDcapital				-0.052750*	-0.052699*
				(0.027093)	(0.027080)
CapexAssets				-0.027913*	-0.027830*
				(0.014826)	(0.014817)
AcqAssets				-0.000497	-0.000420
_				(0.004058)	(0.004041)
PPEGrowtht				0.000040	
				(0.000184)	
PPEGrowtht1					0.000000
					(0.000010)
_cons	-0.000011	0.006126***	0.005449***	0.008841***	0.008827***
	(0.000168)	(0.000879)	(0.000967)	(0.002234)	(0.002232)
Obs.	8090	7580	6550	3850	3854
R-squared	0.000272	0.011662	0.010595	0.009541	0.009524
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

OPMt	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	0.094629*	0.089716	0.107157	0.006666	0.006705	
	(0.052517)	(0.056879)	(0.065827)	(0.005325)	(0.005394)	
LnAssets		-0.011844**	-0.010556*	-0.012583**	-0.011214*	
		(0.562022)	(0.633727)	(0.005860)	(0.005931)	
Tobinq		0.000274		0.000065	0.000065	
		(0.008302)		(0.000139)	(0.000141)	
ROA		0.186019***		0.479017***	0.476780***	
		(0.065684)		(0.069491)	(0.070367)	
Leverage			0.023028	-0.031466	-0.019436	
			(0.030248)	(0.028768)	(0.029114)	
CashAssets			-0.144150***	0.006215	0.029238	
			(0.045792)	(0.037522)	(0.037930)	
RDcapital			. ,	-0.180461	-0.166719	
I.				(0.212909)	(0.215657)	
CapexAssets				-0.172182	-0.080164	
				(0.121873)	(0.123091)	
AcqAssets				-0.018877	-0.020933	
1				(0.033082)	(0.033417)	
PPEGrowtht				-0.002277*	· · · · ·	
				(0.001279)		
PPEGrowtht1					-0.000193**	
					(0.000087)	
BlockDummv					(******)	-0.508037
,						(0.824600)
cons	-0.540840*	-2.046909	-1.729824	0.137332***	0.124958***	0.379646
-	(0.324853)	(1.412081)	(1.567988)	(0.017593)	(0.017762)	(0.752660)
Obs.	9731	9100	7888	4575	4580	9731
R-squared	0.000377	0.002030	0.002743	0.015377	0.015517	0.000044
Firm Dummy	YES	YES	YES	YES	YES	YES
Vear Dummy	VES	VES	VES	VES	VES	VES

# Table 13-b: Regression results

OPMt	(1)	(2)	(3)	(4)	(5)
NumConnected	0.056392	0.048554	0.097194	0.000211	0.000192
	(0.043261)	(0.047694)	(0.065892)	(0.000555)	(0.000562)
LnAssets		-0.119985**	-0.101454	-0.012300**	-0.010902*
		(0.056374)	(0.063841)	(0.005885)	(0.005955)
Tobinq		0.000222		0.000065	0.000065
		(0.008303)		(0.000139)	(0.000141)
ROA		0.186018***		0.478089***	0.475798***
		(0.065691)		(0.069510)	(0.070387)
Leverage			0.025813	-0.030369	-0.018319
8			(0.030243)	(0.028759)	(0.029104)
CashAssets			-0.146515***	0.006107	0.029183
			(0.045872)	(0.037550)	(0.037958)
RDcapital				-0.183817	-0.170030
·				(0.212942)	(0.215690)
CapexAssets				-0.172406	-0.080513
				(0.121937)	(0.123158)
AcqAssets				-0.019726	-0.021801
1				(0.033083)	(0.033418)
PPEGrowtht				-0.002272*	· · · ·
				(0.001279)	
PPEGrowtht1					-0.000192**
					(0.000088)
_cons	-0.234242	-1.777128	-1.404737	0.139618***	0.127257***
_	(0.230231)	(1.403684)	(1.559227)	(0.017497)	(0.017664)
Obs.	9731	9100	7888	4575	4580
R-squared	0.000197	0.001849	0.002675	0.015012	0.015151
Firm Dummy	YES	YES	YES	YES	YES
Vaar Dummu	VEC	VTC	VTC	VTC	VTC

OPMt	(1)	(2)	(3)	(4)	(5)
NumCross	0.060978**	0.058030*	0.069109**	0.001489	0.001374
	(0.027416)	(0.029776)	(0.033654)	(0.002698)	(0.002733)
LnAssets		-0.119066**	-0.105449*	-0.012202**	-0.010816*
		(0.056080)	(0.063235)	(0.005852)	(0.005923)
Tobinq		-0.000148		0.000064	0.000064
		(0.008305)		(0.000139)	(0.000141)
ROA		0.181212***		0.478981***	0.476627***
		(0.065731)		(0.069543)	(0.070421)
Leverage			0.022881	-0.030772	-0.018692
			(0.030240)	(0.028772)	(0.029117)
CashAssets			-0.144278***	0.006677	0.029700
			(0.045782)	(0.037527)	(0.037935)
RDcapital				-0.184898	-0.171037
				(0.212953)	(0.215702)
CapexAssets				-0.172055	-0.080173
				(0.121923)	(0.123143)
AcqAssets				-0.019782	-0.021851
^				(0.033078)	(0.033413)
PPEGrowtht				-0.002272*	
				(0.001279)	
PPEGrowtht1					-0.000191**
					(0.000088)
_cons	-0.558307*	-2.108828	-1.747018	0.138693***	0.126404***
-	(0.292102)	(1.412182)	(1.565151)	(0.017588)	(0.017757)
Obs.	9731	9100	7888	4575	4580
R-squared	0.000574	0.002193	0.002968	0.015053	0.015186
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

Table 13-d: Reg	ression	results
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OPMt	(1)	(2)	(3)	(4)	(5)
	0.040000	0.001/20		0.001050	0.001010
AvgNum	0.049909	0.0346/3	0.102380	0.001059	0.001043
<b>x</b> . 1	(0.064089)	(0.069454)	(0.111/61)	(0.000946)	(0.000958)
LnAssets		-0.12355/**	-0.106865*	-0.012922**	-0.011534*
		(0.056393)	(0.063906)	(0.005897)	(0.005968)
Tobinq		0.000282		0.000063	0.000063
		(0.008304)		(0.000139)	(0.000141)
ROA		0.186587***		0.477628***	0.475399***
		(0.065695)		(0.069483)	(0.070360)
Leverage			0.025421	-0.030520	-0.018477
			(0.030247)	(0.028754)	(0.029099)
CashAssets			-0.144424***	0.005511	0.028560
			(0.045849)	(0.037535)	(0.037943)
RDcapital				-0.181268	-0.167561
				(0.212913)	(0.215663)
CapexAssets				-0.170793	-0.078807
-				(0.121900)	(0.123120)
AcqAssets				-0.019000	-0.021074
1				(0.033084)	(0.033419)
PPEGrowtht				-0.002276*	( )
				(0.001279)	
PPEGrowtht1					-0.000192**
					(0.000087)
cons	-0.157751	-1.777171	-1.422731	0.139739***	0.127371***
	(0.223513)	(1.404318)	(1.559394)	(0.017493)	(0.017660)
Obs.	9731	9100	7888	4575	4580
R-squared	0.000070	0.001751	0.002484	0.015296	0.015425
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES
	1110	110	110	110	- 10

OPMt	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	0.045926*	0.046767*	0.057549*	0.013648	0.012527
	(0.024291)	(0.027123)	(0.031616)	(0.027466)	(0.027825)
LnAssets		-0.120465**	-0.109438*	-0.012123**	-0.010742*
		(0.056063)	(0.063129)	(0.005847)	(0.005918)
Tobinq		-0.000038		0.000065	0.000065
		(0.008304)		(0.000139)	(0.000141)
ROA		0.183503***		0.478659***	0.476334***
		(0.065702)		(0.069531)	(0.070409)
Leverage			0.021458	-0.030837	-0.018752
			(0.003281)	(0.028781)	(0.029126)
CashAssets			-0.142932***	0.007052	0.030042
			(0.045775)	(0.037538)	(0.037946)
RDcapital			. ,	-0.184769	-0.170914
*				(0.212955)	(0.215704)
CapexAssets				-0.172360	-0.080456
1				(0.121918)	(0.123138)
AcqAssets				-0.019814	-0.021885
1				(0.033078)	(0.033413)
PPEGrowtht				-0.002275*	· · · · ·
				(0.001279)	
PPEGrowtht1					-0.000191**
					(0.000088)
cons	-0.452511	-2.046264	-1.726132	0.138674***	0.126391***
	(0.279432)	(1 410585)	(1.565886)	(0.017614)	(0.017783)
Obs.	9731	9100	7888	4575	4580
R-squared	0.000415	0.002090	0.002838	0.015038	0.015173
Firm Dummy	YES	YES	YES	YES	YES
Vear Dummy	VES	VES	VES	VES	VES

## Table 14-a: Quantile Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
CrossDummy	-0.000965***	-0.000265*	-0.000294**	-0.000155	-0.000150
	(0.000138)	(0.000142)	(0.000148)	(0.000224)	(0.000223)
LnAssets		0.000665***	0.000857***	0.001143***	0.001147***
		(0.000045)	(0.000056)	(0.000086)	(0.000086)
Tobinq		0.000000		0.000001	0.000001
		(0.000002)		(0.000008)	(0.000008)
ROA		0.003262***		0.005368**	0.005464**
		(0.001065)		(0.002301)	(0.002292)
Leverage			-0.000494	-0.000988	-0.001010
			(0.000455)	(0.000766)	(0.000763)
CashAssets			0.001436*	0.001519	0.001506
			(0.000766)	(0.001276)	(0.001271)
RDcapital			. ,	0.007902**	0.007969**
I.				(0.003748)	(0.003733)
CapexAssets				0.000212	0.000400
1				(0.003220)	(0.003208)
AcqAssets				0.005100***	0.005455***
1				(0.001627)	(0.001616)
PPEGrowtht				0.000077	( )
				(0.000062)	
PPEGrowtht1					-0.000001
					(0.000005)
cons	0.002217***	0.000340*	0.000531**	-0.000472	-0.000493
_	(0.000090)	(0.000180)	(0.000215)	(0.000422)	(0.000420)
Obs	9571	8945	7762	4503	4508

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
CrossDummy	-0.000996***	-0.000292**	-0.000290*	-0.000150	-0.000154
	(0.000141)	(0.000149)	(0.000149)	(0.000249)	(0.000248)
LnAssets		0.000703***	0.000912***	0.001203***	0.001217***
		(0.000047)	(0.000056)	(0.000096)	(0.000096)
Tobinq		0.000000	. ,	0.000001	0.000001
		(0.000002)		(0.000008)	(0.000008)
ROA		0.003494***		0.005323**	0.005405**
		(0.001118)		(0.002555)	(0.002547)
Leverage		. ,	-0.000502	-0.001093	-0.001138
0			(0.000459)	(0.000851)	(0.000848)
CashAssets			0.001519**	0.001324	0.001423
			(0.000772)	(0.001418)	(0.001413)
RDcapital			· · · · ·	0.008567**	0.008904**
L				(0.004162)	(0.004148)
CapexAssets				0.000248	0.000302
1.				(0.003576)	(0.003565)
AcqAssets				0.005313***	0.005761***
1				(0.001807)	(0.001796)
PPEGrowtht				0.000076	( )
				(0.000069)	
PPEGrowtht1				. ,	-0.000001
					(0.000005)
cons	0.002270***	0.000341*	0.000510**	-0.000467	-0.000489
-	(0.000092)	(0.000189)	(0.000216)	(0.000468)	(0.000466)
Obs.	9571	8945	7762	4503	4508

## Table 14-b: Quantile Regression results

#### Table 14-c: Quantile Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
CrossDummy	-0.001965***	-0.000584**	-0.000796***	-0.000526	-0.000509
-	(0.000265)	(0.000261)	(0.000269)	(0.000392)	(0.000393)
LnAssets		0.001179***	0.001452***	0.001879***	0.001875***
		(0.000083)	(0.000102)	(0.000151)	(0.000151)
Tobinq		0.000000		0.000005	0.000005
•		(0.000004)		(0.000012)	(0.000012)
ROA		0.005780***		0.009076**	0.008938**
		(0.002039)		(0.004049)	(0.004064)
Leverage			-0.001034	-0.000866	-0.000863
			(0.000822)	(0.001325)	(0.001330)
CashAssets			0.002867**	0.004581**	0.004593**
			(0.001393)	(0.002273)	(0.002282)
RDcapital				0.015189**	0.015113**
_				(0.006436)	(0.006460)
CapexAssets				0.003707	0.003597
-				(0.005498)	(0.005520)
AcqAssets				0.005220*	0.004745*
_				(0.002814)	(0.002818)
PPEGrowtht				-0.000036	
				(0.000101)	
PPEGrowtht1					-0.000001
					(0.000008)
_cons	0.004138***	0.000830**	0.001285***	-0.000880	-0.000866
	(0.000171)	(0.000335)	(0.000387)	(0.000735)	(0.000738)
Obs.	8090	7580	6550	3850	3854

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
CrossDummy	-0.002056***	-0.000590**	-0.000784***	-0.000556	-0.000572
	(0.000270)	(0.000265)	(0.000285)	(0.000396)	(0.000395)
LnAssets		0.001201***	0.001540***	0.001965***	0.001961***
		(0.000084)	(0.000108)	(0.000152)	(0.000152)
Tobinq		0.000000		0.000005	0.000005
1		(0.000004)		(0.000013)	(0.000012)
ROA		0.005964***		0.010128**	0.010049**
		(0.002072)		(0.004089)	(0.004078)
Leverage			-0.001072	-0.000946	-0.000945
0			(0.000871)	(0.001338)	(0.001335)
CashAssets			0.002987**	0.004296*	0.004404*
			(0.001476)	(0.002295)	(0.002289)
RDcapital			. ,	0.018676***	0.018455***
				(0.006499)	(0.006482)
CapexAssets				0.003387	0.003360
				(0.005552)	(0.005538)
AcqAssets				0.004853*	0.004426
*				(0.002842)	(0.002827)
PPEGrowtht				-0.000037	( /
				(0.000102)	
PPEGrowtht1					-0.000001
					(0.000008)
_cons	0.004259***	0.000830**	0.001267***	-0.000918	-0.000894
_	(0.000174)	(0.000341)	(0.000410)	(0.000743)	(0.000740)
Obs	8090	7580	6550	3850	3854

## Table 14-d: Quantile Regression results

# Table 14-e: Quantile Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumConnected	-0.000035***	-0.000025**	-0.000027**	-0.000017	-0.000017
	(0.000011)	(0.000011)	(0.000013)	(0.000021)	(0.000022)
LnAssets		0.000675***	0.000879***	0.001140***	0.001146***
		(0.000042)	(0.000054)	(0.000079)	(0.000082)
Tobinq		0.000000		0.000002	0.000002
_		(0.000002)		(0.000007)	(0.000007)
ROA		0.003308***		0.005387**	0.005435**
		(0.001016)		(0.002140)	(0.002206)
Leverage			-0.000434	-0.000958	-0.000952
			(0.000441)	(0.000712)	(0.000733)
CashAssets			0.001581**	0.001420	0.001483
			(0.000743)	(0.001186)	(0.001223)
RDcapital				0.008101**	0.008295**
-				(0.003493)	(0.003601)
CapexAssets				0.000771	0.000397
-				(0.002987)	(0.003080)
AcqAssets				0.005177***	0.005372***
-				(0.001513)	(0.001555)
PPEGrowtht				0.000078	
				(0.000057)	
PPEGrowtht1					-0.000001
					(0.000005)
_cons	0.001868***	0.000265*	0.000412**	-0.000525	-0.000531
	(0.000073)	(0.000158)	(0.000198)	(0.000376)	(0.000388)
Obs.	9571	8945	7762	4503	4508

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumConnected	-0.000036***	-0.000026**	-0.000027**	-0.000016	-0.000016
	(0.000012)	(0.000012)	(0.000014)	(0.000025)	(0.000025)
LnAssets		0.000726***	0.000913***	0.001208***	0.001213***
		(0.000046)	(0.000055)	(0.000092)	(0.000092)
Tobinq		0.000000		0.000002	0.000002
*		(0.000002)		(0.000008)	(0.000008)
ROA		0.003697***		0.005555**	0.005651**
		(0.001089)		(0.002468)	(0.002478)
Leverage			-0.000439	-0.001075	-0.001075
			(0.000452)	(0.000821)	(0.000824)
CashAssets			0.001674**	0.001361	0.001450
			(0.000761)	(0.001368)	(0.001374)
RDcapital			. ,	0.008335**	0.008665**
1				(0.004029)	(0.004045)
CapexAssets				0.000486	0.000301
*				(0.003446)	(0.003460)
AcqAssets				0.005409***	0.005498***
1				(0.001745)	(0.001747)
PPEGrowtht				0.000077	· · · ·
				(0.000066)	
PPEGrowtht1					-0.000001
					(0.000005)
cons	0.001911***	0.000235	0.000407**	-0.000535	-0.000548
-	(0.000078)	(0.000170)	(0.000203)	(0.000434)	(0.000436)
Obs	9571	8945	7762	4503	4508

## Table 14-f: Quantile Regression results

#### Table 14-g: Quantile Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	-0.000090***	-0.000050**	-0.000056*	-0.000035	-0.000035
	(0.000024)	(0.000023)	(0.000029)	(0.000042)	(0.000043)
LnAssets		0.001182***	0.001505***	0.001855***	0.001858***
		(0.000076)	(0.000104)	(0.000144)	(0.000147)
Tobinq		0.000001		0.000005	0.000005
_		(0.000004)		(0.000012)	(0.000012)
ROA		0.006209***		0.009284**	0.009083**
		(0.001911)		(0.003913)	(0.003983)
Leverage			-0.000844	-0.000806	-0.000794
			(0.000849)	(0.001281)	(0.001303)
CashAssets			0.003723***	0.004392**	0.004395**
			(0.001436)	(0.002195)	(0.002235)
RDcapital				0.016368***	0.016097**
*				(0.006231)	(0.006342)
CapexAssets				0.002740	0.002724
î				(0.005294)	(0.005391)
AcqAssets				0.004141	0.004238
*				(0.002719)	(0.002761)
PPEGrowtht				-0.000033	
				(0.000097)	
PPEGrowtht1					-0.000002
					(0.000008)
_cons	0.003580***	0.000649**	0.000844**	-0.000992	-0.000977
	(0.000134)	(0.000291)	(0.000380)	(0.000681)	(0.000693)
Obs.	8090	7580	6550	3850	3854

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	-0.000091***	-0.000051**	-0.000059**	-0.000033	-0.000034
	(0.000025)	(0.000024)	(0.000029)	(0.000043)	(0.000043)
LnAssets		0.001233***	0.001578***	0.001976***	0.001975***
		(0.000079)	(0.000106)	(0.000148)	(0.000148)
Tobinq		0.000001		0.000006	0.000006
-		(0.000004)		(0.000012)	(0.000012)
ROA		0.006400***		0.010128**	0.010151**
		(0.001971)		(0.003998)	(0.004005)
Leverage			-0.000845	-0.000796	-0.000794
-			(0.000863)	(0.001309)	(0.001311)
CashAssets			0.003664**	0.004283*	0.004371*
			(0.001460)	(0.002243)	(0.002247)
RDcapital				0.019047***	0.018922***
•				(0.006368)	(0.006377)
CapexAssets				0.002888	0.002849
*				(0.005410)	(0.005421)
AcqAssets				0.004244	0.004182
*				(0.002779)	(0.002776)
PPEGrowtht				-0.000035	. ,
				(0.000099)	
PPEGrowtht1				. ,	-0.000002
					(0.000008)
_cons	0.003634***	0.000650**	0.000864**	-0.001129	-0.001126
	(0.000141)	(0.000300)	(0.000387)	(0.000696)	(0.000697)
Obs.	8090	7580	6550	3850	3854

## Table 14-h: Quantile Regression results

# Table 14-i: Quantile Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000320***	-0.000078	-0.000072	-0.000035	-0.000028
	(0.000063)	(0.000068)	(0.000067)	(0.000100)	(0.000104)
LnAssets		0.000662***	0.000874***	0.001151***	0.001150***
		(0.000045)	(0.000054)	(0.000083)	(0.000087)
Tobinq		0.000000		0.000002	0.000001
<b>^</b>		(0.000002)		(0.000007)	(0.000008)
ROA		0.003387***		0.005438**	0.005522**
		(0.001048)		(0.002194)	(0.002287)
Leverage			-0.000465	-0.001026	-0.001029
-			(0.000434)	(0.000731)	(0.000761)
CashAssets			0.001561**	0.001433	0.001434
			(0.000729)	(0.001217)	(0.001268)
RDcapital			. ,	0.008410**	0.008630**
*				(0.003573)	(0.003723)
CapexAssets				0.000538	0.000388
*				(0.003063)	(0.003193)
AcqAssets				0.004920***	0.005413***
<u>^</u>				(0.001550)	(0.001612)
PPEGrowtht				0.000077	. ,
				(0.000059)	
PPEGrowtht1				. ,	-0.000001
					(0.000005)
_cons	0.002022***	0.000272	0.000402**	-0.000525	-0.000542
	(0.000080)	(0.000174)	(0.000201)	(0.000398)	(0.000414)
Obs.	9571	8945	7762	4503	4508

Τa	able	14-j:	Q	uantile	R	egression	results
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MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000334***	-0.000083	-0.000071	-0.000036	-0.000034
	(0.000067)	(0.000071)	(0.000069)	(0.000117)	(0.000118)
LnAssets		0.000709***	0.000918***	0.001212***	0.001215***
		(0.000047)	(0.000055)	(0.000098)	(0.000098)
Tobinq		0.000000		0.000001	0.000001
		(0.000002)		(0.000008)	(0.000008)
ROA		0.003711***		0.005613**	0.005666**
		(0.001094)		(0.002573)	(0.002587)
Leverage			-0.000489	-0.001097	-0.001105
			(0.000444)	(0.000857)	(0.000861)
CashAssets			0.001527**	0.001414	0.001395
			(0.000746)	(0.001427)	(0.001435)
RDcapital				0.008751**	0.008910**
				(0.004191)	(0.004212)
CapexAssets				0.000274	0.000291
				(0.003593)	(0.003612)
AcqAssets				0.005264***	0.005409***
_				(0.001819)	(0.001823)
PPEGrowtht				0.000077	
				(0.000069)	
PPEGrowtht1					-0.000001
					(0.000005)
_cons	0.002084***	0.000243	0.000399*	-0.000552	-0.000559
	(0.000084)	(0.000182)	(0.000206)	(0.000466)	(0.000469)
Obs.	9571	8945	7762	4503	4508

## Table 14-k: Quantile Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000627***	-0.000148	-0.000173	-0.000082	-0.000083
	(0.000118)	(0.000117)	(0.000130)	(0.000181)	(0.000181)
LnAssets		0.001178***	0.001507***	0.001876***	0.001873***
		(0.000078)	(0.000104)	(0.000151)	(0.000151)
Tobinq		0.000000		0.000005	0.000005
-		(0.000004)		(0.000012)	(0.000012)
ROA		0.006101***		0.009027**	0.008919**
		(0.001909)		(0.004023)	(0.004012)
Leverage			-0.000943	-0.000909	-0.000944
			(0.000837)	(0.001317)	(0.001313)
CashAssets			0.002974**	0.004151*	0.004151*
			(0.001414)	(0.002256)	(0.002250)
RDcapital				0.016779***	0.016625***
				(0.006391)	(0.006372)
CapexAssets				0.002471	0.002287
				(0.005449)	(0.005435)
AcqAssets				0.004529	0.004513
				(0.002795)	(0.002779)
PPEGrowtht				-0.000032	
				(0.000100)	
PPEGrowtht1					-0.000002
					(0.000008)
_cons	0.003788***	0.000667**	0.000946**	-0.000994	-0.000961
~.	(0.000147)	(0.000307)	(0.000386)	(0.000721)	(0.000719)
Obs.	8090	7580	6550	3850	3854

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumCross	-0.000642***	-0.000156	-0.000173	-0.000082	-0.000083
	(0.000118)	(0.000122)	(0.000136)	(0.000188)	(0.000190)
LnAssets		0.001226***	0.001570***	0.001988***	0.001985***
		(0.000082)	(0.000109)	(0.000157)	(0.000158)
Tobinq		0.000000		0.000005	0.000005
-		(0.000004)		(0.000013)	(0.000013)
ROA		0.006252***		0.009941**	0.009901**
		(0.001997)		(0.004179)	(0.004209)
Leverage			-0.001005	-0.001010	-0.001020
-			(0.000881)	(0.001368)	(0.001378)
CashAssets			0.003142**	0.003648	0.003745
			(0.001488)	(0.002344)	(0.002361)
RDcapital				0.019467***	0.019112***
*				(0.006638)	(0.006685)
CapexAssets				0.002495	0.002302
1.				(0.005659)	(0.005702)
AcqAssets				0.004422	0.004392
*				(0.002903)	(0.002916)
PPEGrowtht				-0.000034	. ,
				(0.000104)	
PPEGrowtht1				. ,	-0.000002
					(0.000008)
_cons	0.003864***	0.000663**	0.000945**	-0.001069	-0.001051
	(0.000148)	(0.000321)	(0.000406)	(0.000749)	(0.000754)
Obs.	8090	7580	6550	3850	3854

## Table 14-1: Quantile Regression results

#### Table 14-m: Quantile Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
AvgNum	-0.000022	-0.000049***	-0.000062**	-0.000047	-0.000044
0	(0.000018)	(0.000018)	(0.000026)	(0.000039)	(0.000040)
LnAssets	· · · ·	0.000701***	0.000883***	0.001149***	0.001155***
		(0.000043)	(0.000056)	(0.000080)	(0.000082)
Tobinq		0.000000		0.000002	0.000002
*		(0.000002)		(0.000007)	(0.000007)
ROA		0.003550***		0.005517**	0.005619**
		(0.001037)		(0.002181)	(0.002212)
Leverage			-0.000482	-0.001014	-0.001031
			(0.000464)	(0.000724)	(0.000734)
CashAssets			0.001577**	0.001315	0.001272
			(0.000784)	(0.001208)	(0.001226)
RDcapital				0.007839**	0.008149**
				(0.003553)	(0.003604)
CapexAssets				0.000590	0.000695
				(0.003043)	(0.003087)
AcqAssets				0.005229***	0.005667***
				(0.001541)	(0.001560)
PPEGrowtht				0.000077	
				(0.000058)	
PPEGrowtht1					-0.000001
					(0.000005)
_cons	0.001787***	0.000241	0.000428**	-0.000492	-0.000509
	(0.000073)	(0.000160)	(0.000209)	(0.000382)	(0.000388)
Obs.	9571	8945	7762	4503	4508

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
AvgNum	-0.000023	-0.000052***	-0.000060**	-0.000043	-0.000044
	(0.000019)	(0.000020)	(0.000025)	(0.000043)	(0.000045)
LnAssets		0.000733***	0.000933***	0.001213***	0.001219***
		(0.000046)	(0.000056)	(0.000088)	(0.000091)
Tobinq		0.000000		0.000002	0.000002
		(0.000002)		(0.000008)	(0.000008)
ROA		0.003660***		0.005605**	0.005608**
		(0.001104)		(0.002399)	(0.002464)
Leverage			-0.000546	-0.001132	-0.001128
			(0.000456)	(0.000796)	(0.000817)
CashAssets			0.001748**	0.001191	0.001331
			(0.000770)	(0.001329)	(0.001366)
RDcapital				0.008289**	0.008385**
				(0.003908)	(0.004015)
CapexAssets				0.000485	0.000609
				(0.003346)	(0.003439)
AcqAssets				0.005507***	0.005695***
				(0.001695)	(0.001737)
PPEGrowtht				0.000076	
				(0.000064)	
PPEGrowtht1					-0.000001
					(0.000005)
_cons	0.001844***	0.000236	0.000412**	-0.000499	-0.000525
	(0.000077)	(0.000170)	(0.000206)	(0.000420)	(0.000432)
Obs.	9571	8945	7762	4503	4508

## Table 14-n: Quantile Regression results

## Table 14-o: Quantile Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
AvgNum	-0.000088**	-0.000107***	-0.000154***	-0.000104	-0.000107
	(0.000040)	(0.000038)	(0.000054)	(0.000079)	(0.000078)
LnAssets		0.001225***	0.001516***	0.001853***	0.001837***
		(0.000075)	(0.000102)	(0.000143)	(0.000142)
Tobinq		0.000001		0.000005	0.000005
		(0.000003)		(0.000012)	(0.000012)
ROA		0.006444***		0.008550**	0.008474**
		(0.001887)		(0.003902)	(0.003881)
Leverage			-0.000940	-0.000901	-0.000883
			(0.000836)	(0.001274)	(0.001267)
CashAssets			0.003663***	0.004199*	0.004125*
			(0.001420)	(0.002188)	(0.002177)
RDcapital				0.014955**	0.015285**
				(0.006207)	(0.006173)
CapexAssets				0.002771	0.003012
				(0.005279)	(0.005253)
AcqAssets				0.004339	0.003877
				(0.002712)	(0.002691)
PPEGrowtht				-0.000034	
				(0.000097)	
PPEGrowtht1					-0.000002
					(0.000007)
_cons	0.003505***	0.000633**	0.000968**	-0.000794	-0.000776
	(0.000136)	(0.000285)	(0.000377)	(0.000678)	(0.000674)
Obs.	8090	7580	6550	3850	3854

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
AvgNum	-0.000090**	-0.000109***	-0.000157***	-0.000105	-0.000107
0	(0.000042)	(0.000039)	(0.000057)	(0.000081)	(0.000079)
LnAssets	· · · ·	0.001256***	0.001579***	0.001974***	0.001970***
		(0.000077)	(0.000107)	(0.000147)	(0.000143)
Tobing		0.000001		0.000005	0.000005
*		(0.000004)		(0.000012)	(0.000012)
ROA		0.006595***		0.009238**	0.009210**
		(0.001935)		(0.004016)	(0.003904)
Leverage			-0.000945	-0.000906	-0.000965
0			(0.000878)	(0.001312)	(0.001275)
CashAssets			0.003754**	0.004392*	0.004347**
			(0.001492)	(0.002252)	(0.002190)
RDcapital			. ,	0.019012***	0.018660***
*				(0.006388)	(0.006210)
CapexAssets				0.002888	0.003178
*				(0.005433)	(0.005284)
AcqAssets				0.004053	0.003799
-				(0.002791)	(0.002707)
PPEGrowtht				-0.000036	
				(0.000100)	
PPEGrowtht1					-0.000002
					(0.000007)
_cons	0.003576***	0.000624**	0.000969**	-0.000935	-0.000899
	(0.000142)	(0.000292)	(0.000396)	(0.000698)	(0.000678)
Obs.	8090	7580	6550	3850	3854

## Table 14-p: Quantile Regression results

## Table 14-q: Ouantile Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.003657***	-0.001054	-0.000674	-0.000377	-0.000354
	(0.000761)	(0.000781)	(0.000784)	(0.001208)	(0.001228)
LnAssets		0.000662***	0.000878***	0.001145***	0.001150***
		(0.000045)	(0.000054)	(0.000085)	(0.000087)
Tobinq		0.000000		0.000002	0.000001
<b>^</b>		(0.000002)		(0.000007)	(0.000008)
ROA		0.003387***		0.005354**	0.005520**
		(0.001046)		(0.002254)	(0.002291)
Leverage		. ,	-0.000478	-0.001041	-0.001033
-			(0.000440)	(0.000753)	(0.000766)
CashAssets			0.001596**	0.001448	0.001418
			(0.000735)	(0.001249)	(0.001270)
RDcapital				0.008156**	0.008657**
*				(0.003670)	(0.003731)
CapexAssets				0.000589	0.000447
*				(0.003146)	(0.003198)
AcqAssets				0.005040***	0.005286***
*				(0.001592)	(0.001615)
PPEGrowtht				0.000078	( )
				(0.000060)	
PPEGrowtht1				· · · ·	-0.000001
					(0.000005)
_cons	0.001993***	0.000271	0.000381*	-0.000518	-0.000540
	(0.000081)	(0.000173)	(0.000200)	(0.000404)	(0.000411)
Obs	9572	8946	7762	4503	¥508

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.003723***	-0.001067	-0.000622	-0.000367	-0.000356
	(0.000780)	(0.000822)	(0.000805)	(0.001370)	(0.001391)
LnAssets		0.000704***	0.000925***	0.001212***	0.001210***
		(0.000047)	(0.000056)	(0.000097)	(0.000098)
Tobinq		0.000000		0.000001	0.000001
-		(0.000002)		(0.000008)	(0.000009)
ROA		0.003619***		0.005623**	0.005659**
		(0.001101)		(0.002554)	(0.002595)
Leverage			-0.000502	-0.001115	-0.001102
			(0.000452)	(0.000854)	(0.000867)
CashAssets			0.001546**	0.001370	0.001433
			(0.000754)	(0.001416)	(0.001438)
RDcapital				0.008777**	0.008846**
-				(0.004159)	(0.004226)
CapexAssets				0.000331	0.000289
*				(0.003565)	(0.003623)
AcqAssets				0.005335***	0.005432***
				(0.001805)	(0.001829)
PPEGrowtht				0.000077	. ,
				(0.000068)	
PPEGrowtht1				. ,	-0.000001
					(0.000005)
_cons	0.002026***	0.000253	0.000376*	-0.000550	-0.000555
	(0.000083)	(0.000182)	(0.000205)	(0.000458)	(0.000466)
Obs.	9572	8946	7762	4503	<b>4508</b>

## Table 14-r: Quantile Regression results

## Table 14-s: Quantile Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.006780***	-0.001892	-0.001814	-0.000843	-0.000857
	(0.001322)	(0.001354)	(0.001532)	(0.002126)	(0.002112)
LnAssets		0.001187***	0.001513***	$0.001884^{***}$	0.001878***
		(0.000079)	(0.000107)	(0.000153)	(0.000152)
Tobinq		0.000001		0.000005	0.000005
		(0.000004)		(0.000012)	(0.000012)
ROA		0.006033***		0.009881**	0.009751**
		(0.001925)		(0.004062)	(0.004036)
Leverage			-0.000993	-0.000865	-0.000860
			(0.000867)	(0.001336)	(0.001327)
CashAssets			0.003283**	0.004026*	0.004097*
			(0.001455)	(0.002277)	(0.002263)
RDcapital				0.017150***	0.016771***
				(0.006453)	(0.006410)
CapexAssets				0.002285	0.002363
				(0.005499)	(0.005465)
AcqAssets				0.004592	0.004378
				(0.002821)	(0.002796)
PPEGrowtht				-0.000032	
				(0.000101)	
PPEGrowtht1					-0.000002
					(0.000008)
_cons	0.003736***	0.000682**	0.000865**	-0.001098	-0.001078
	(0.000141)	(0.000308)	(0.000392)	(0.000721)	(0.000716)
Obs.	8090	7580	6550	3850	3854

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	-0.006926***	-0.001902	-0.001759	-0.000870	-0.000830
	(0.001385)	(0.001402)	(0.001596)	(0.002225)	(0.002212)
LnAssets		0.001237***	0.001580***	0.001978***	0.001995***
		(0.000082)	(0.000111)	(0.000160)	(0.000159)
Tobinq		0.000001		0.000005	0.000005
-		(0.000004)		(0.000013)	(0.000013)
ROA		0.006358***		0.010447**	0.010033**
		(0.001993)		(0.004252)	(0.004228)
Leverage			-0.001119	-0.000889	-0.000859
			(0.000902)	(0.001398)	(0.001390)
CashAssets			0.003245**	0.003840	0.003786
			(0.001515)	(0.002383)	(0.002370)
RDcapital				0.019525***	0.019265***
				(0.006753)	(0.006715)
CapexAssets				0.002353	0.002255
				(0.005755)	(0.005725)
AcqAssets				0.004412	0.004181
*				(0.002953)	(0.002928)
PPEGrowtht				-0.000033	
				(0.000106)	
PPEGrowtht1				. ,	-0.000002
					(0.000008)
_cons	0.003807***	0.000655**	0.000890**	-0.001161	-0.001125
	(0.000148)	(0.000319)	(0.000408)	(0.000754)	(0.000750)
Obs.	8090	7580	6550	3850	3854

Table 14-t: Quantile Regression results

However, when we include a wider set of variables (such as CapexAssets, AcqAssets and R&Dcapital), cross-ownership does not retain any statistically relevant explanatory power.

Overall, this pattern of cross-ownership proxies losing significance in multivariate models is a novelty with respect to the baseline model, where horizontal shareholding measures were steadily irrelevant.

Other coefficients that tend to be statistically significant in TABLE 14-a/14-t are LnAssets (+), ROA (+), CashAssets (+), R&D capital (+), AcqAssets (+).

Fourth, we may be concerned by the fact that market share growth computed starting from Fama-French 12 industries classification does not show considerable variability across the sample, as recognizable from **TABLE 2**. This, in turn, might affect in principle the purpose itself of studying cross-ownership effects on market share changes. Thus, without modifying the way in which we compute cross-ownership measures, we decide

to calculate market-shares (and, as a result, market share growth) in a different way: instead of computing the sum of revenues for all the European companies within one industry in a specific year in order to have market sales, we compute the sum of European listed companies revenues for each single SIC code (and we do not consider the observations for which the market share turns out to be equal to 100%, meaning that the company is the only one with a four-digit SIC code in the entire sample). In this way, given the restricted perimeter of markets, we have larger variability in market shares. This translates in larger variability also for market share growth, as can be noticed from the summary statistics of the newly defined variables, as depicted in **TABLE 15**. As a matter of fact, while mean and median values for the four market share growth measures are substantially close to 0, standard deviation proves to be in a range from 4.24% to 8.35%. This is a result definitely in line with the statistics found by He and Huang (2017), whose standard deviation for the variable MktShareGrowthut is equal to 6.6%.

TABLE 15: 9	Summary	statistics
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	Mean	P25	Median	P75	SD	Skewness	Kurtosis	Ν
MktShareGrowt1	0.000560	-0.005515	0.000161	0.006528	0.056966	-0.592670	78.3457	9275
MktShareGrowt3	-0.002129	-0.014453	-0.000039	0.012312	0.083505	-0.442812	26.7819	7769
LnMktShareGrowt1	0.000463	-0.004526	0.000154	0.005380	0.042405	-0.080738	172.3820	9275
LnMktShareGrowt3	-0.001240	-0.011776	-0.000038	0.010488	0.059093	0.358827	38.0211	7769

For a matter of completeness, we decide to re-run all the regressions included in **TABLE** 9-a/9-t but using these new measures, and results are reported in **TABLE 16-a/16-t**. In these regressions, cross-ownership coefficients show a weakly positive statistical significance, with also ROA always positive and significant (and AcqAssets most of the times positive and significant.

## Table 16-a: Regression results

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	0.002854*	0.002999*	0.003688*	0.003526	0.003558	
	(0.001706)	(0.001740)	(0.001961)	(0.002859)	(0.002861)	
LnAssets		-0.002032	-0.001643	-0.002268	-0.002106	
		(0.001663)	(0.001842)	(0.003108)	(0.003109)	
Tobing		0.000010		0.000057	0.000057	
-		(0.000024)		(0.000076)	(0.000076)	
ROA		0.034296*		0.079015**	0.081364**	
		(0.019511)		(0.037137)	(0.037148)	
Leverage		. ,	-0.005893	0.004139	0.004387	
0			(0.008833)	(0.015536)	(0.015531)	
CashAssets			0.003355	0.002411	0.002609	
			(0.013457)	(0.019955)	(0.019906)	
RDcapital			. ,	-0.081257	-0.081919	
1				(0.110627)	(0.110664)	
CapexAssets				-0.038387	-0.037937	
				(0.064534)	(0.064226)	
AcqAssets				0.039227**	0.042285**	
Ĩ				(0.017624)	(0.017583)	
PPEGrowtht				0.001809***	· · · · ·	
				(0.000664)		
PPEGrowtht1				. ,	0.000011	
					(0.000045)	
BlockDummy					( )	0.001653
,						(0.001807)
cons	-0.000651	0.001942	0.003001	-0.001533	-0.002032	-0.000445
-	(0.000951)	(0.004209)	(0.004582)	(0.009391)	(0.009383)	(0.001269)
Obs.	9184	8592	7389	4278	4283	9184
R-squared	0.000345	0.001023	0.000724	0.006413	0.004358	0.000103
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES
,						

# Table 16-b: Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	0.001901	0.002153*	0.002592*	0.002307	0.002332	
	(0.001277)	(0.001220)	(0.001373)	(0.001979)	(0.001980)	
LnAssets	· · · ·	-0.002034*	-0.001852	-0.002327	-0.002201	
		(0.001166)	(0.001290)	(0.002151)	(0.002152)	
Tobing		0.000008	· · · ·	0.000036	0.000036	
*		(0.000017)		(0.000052)	(0.000053)	
ROA		0.022426		0.0499999*	0.051819**	
		(0.013679)		(0.025701)	(0.025715)	
Leverage		( )	-0.004677	0.001587	0.001776	
0			(0.006185)	(0.010752)	(0.010751)	
CashAssets			0.002567	0.001394	0.001542	
			(0.009422)	(0.013810)	(0.013780)	
RDcapital			· · · · ·	-0.057940	-0.058444	
1				(0.076561)	(0.076606)	
CapexAssets				-0.027295	-0.026972	
T				(0.044661)	(0.044459)	
AcqAssets				0.029025**	0.031380***	
-1				(0.012197)	(0.012171)	
PPEG <b>r</b> owtht				0.001395***		
				(0.000459)		
PPEGrowtht1				(01000 107)	0.000008	
11 Horowald					(0.000031)	
BlockDummy					(0.0000001)	0.001186
						(0.001353
cons	-0.000334	0.002935	0.003705	0.001285	0.000901	-0.000249
_00110	(0.000712)	(0.002951)	(0.003209)	(0.006499)	(0.006495)	(0.000950
Obs.	9184	8592	7389	4278	4283	9184
R-squared	0.000273	0.001185	0.000940	0.006995	0.004444	0.000095
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES
i cai Dunniny	11.0	1120	1120	11.0	11.0	11.0

## Table 16-c: Regression results

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	0.004634*	0.005290**	0.004455	0.005220	0.005223	
	(0.002564)	(0.002609)	(0.003022)	(0.004122)	(0.004120)	
LnAssets		-0.015058***	-0.013063***	-0.008263*	-0.008214*	
		(0.002543)	(0.002935)	(0.004701)	(0.004697)	
Tobinq		0.000086***		0.000071	0.000071	
*		(0.000033)		(0.000099)	(0.000099)	
ROA		0.054794*		0.124839**	0.125082**	
		(0.030585)		(0.053536)	(0.053507)	
Leverage		. ,	-0.008397	-0.012309	-0.012209	
0			(0.013319)	(0.022526)	(0.022512)	
CashAssets			0.021816	0.025268	0.025489	
			(0.020747)	(0.029283)	(0.029259)	
RDcapital				-0.051063	-0.050671	
1				(0.163191)	(0.163106)	
CapexAssets				0.043620	0.044172	
T				(0.090349)	(0.090293)	
AcaAssets				0.021617	0.021818	
				(0.025178)	(0.025074)	
PPEGrowtht				0.000119	(0.020000)	
				(0.001107)		
PPEGrowtht1				(01001107)	0.000013	
11 Lolowuld					(0.000019)	
BlockDummy					(0.000035))	-0.000570
DIOCKDUIIIIIy						(0.002694)
cons	-0.004115***	0.026805***	0.019538***	0.000197	0.000011	-0.001849
_0013	(0.001391)	(0.006410)	(0.007160)	(0.013797)	(0.013786)	(0.001866)
Obs	7705	7227	6186	3625	3629	7705
R-squared	0.000483	0.007814	0.004659	0.004805	0.004810	0.000007
Firm Dummy	VES	VES	VES	VES	VES	VES
Vear Dummy	VES	VES	VES	VES	VES	VES
	1123	1123	1120	1 2.5	1125	1123

## Table 16-d: Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)	(6)
CrossDummy	0.003189*	0.004127**	0.003325	0.003551	0.003554	
	(0.001820)	(0.001815)	(0.002109)	(0.002862)	(0.002861)	
LnAssets		-0.012914***	-0.011724***	-0.007666**	-0.007627**	
		(0.001769)	(0.002048)	(0.003264)	(0.003261)	
Tobinq		0.000071***		0.000060	0.000060	
<u>^</u>		(0.000023)		(0.000069)	(0.000069)	
ROA		0.036276*		0.075367**	0.075557**	
		(0.021279)		(0.037170)	(0.037150)	
Leverage		. ,	-0.009989	-0.016115	-0.016033	
0			(0.009297)	(0.015640)	(0.015630)	
CashAssets			0.012640	0.016575	0.016763	
			(0.014482)	(0.020331)	(0.020315)	
RDcapital			· · · · ·	-0.042662	-0.042349	
1				(0.113305)	(0.113247)	
CapexAssets				0.040697	0.041118	
1				(0.062730)	(0.062692)	
AcqAssets				0.017096	0.017238	
1				(0.017481)	(0.017409)	
PPEGrowtht				0.000083		
				(0.000768)		
PPEGrowtht1					0.000010	
					(0.000041)	
BlockDummy						-0.000543
,						(0.001913)
cons	-0.002599***	0.024383***	0.020059***	0.006280	0.006129	-0.000949
-	(0.000987)	(0.004459)	(0.004998)	(0.009579)	(0.009572)	(0.001325)
Obs.	7705	7227	6186	3625	3629	7705
R-squared	0.000454	0.011184	0.007283	0.005864	0.005869	0.000012
Firm Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

## Table 16-e: Regression results

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000018	0.000056	0.000118	0.000298	0.000300
	(0.000136)	(0.000141)	(0.000194)	(0.000298)	(0.000299)
LnAssets		-0.001862	-0.001504	-0.002372	-0.002209
		(0.001670)	(0.001858)	(0.003122)	(0.003123)
Tobinq		0.000010		0.000055	0.000055
		(0.000024)		(0.000076)	(0.000076)
ROA		0.034179*		0.079083**	0.081441**
		(0.019515)		(0.037144)	(0.037155)
Leverage			-0.005210	0.004606	0.004859
			(0.008834)	(0.015529)	(0.015524)
CashAssets			0.003607	0.002232	0.002429
			(0.013475)	(0.019960)	(0.019912)
RDcapital				-0.083402	-0.084070
I				(0.110623)	(0.110660)
CapexAssets				-0.036987	-0.036537
				(0.064564)	(0.064255)
AcaAssets				0.039032**	0.042090**
11041100000				(0.017623)	(0.017582)
PPEGrowtht				0.001811***	(0.017502)
11 Lorowald				(0.000664)	
PPEC rowtht1				(0.000004)	0.000012
11 EOI0wulti					(0.000012)
6005	0.000628	0.002602	0.003800	0.000556	0.000043)
_cons	0.000028	(0.002092	(0.003890	-0.000330	-0.001030
Oh-	(0.000715)	(0.004191)	(0.004504)	(0.009331)	(0.009343)
Obs.	9184	0.000(E2	10000226	42/8	4283
K-squared	0.00002 XES	0.000652	0.000236	0.006267	0.004209 NTES
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

## Table 16-f: Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000034	0.000030	0.000073	0.000209	0.000210
	(0.000102)	(0.000099)	(0.000136)	(0.000207)	(0.000207)
LnAssets		-0.001898	-0.001738	-0.002411	-0.002285
		(0.001171)	(0.001301)	(0.002161)	(0.002162)
Tobing		0.000008	. ,	0.000035	0.000035
1		(0.000017)		(0.000053)	(0.000053)
ROA		0.022333		0.050081*	0.051908**
		(0.013682)		(0.025706)	(0.025719)
Leverage			-0.004209	0.001883	0.002075
0			(0.006185)	(0.010746)	(0.010746)
CashAssets			0.002782	0.001255	0.001401
			(0.009435)	(0.013814)	(0.013784)
RDcapital			(	-0.059347	-0.059857
				(0.076556)	(0.076601)
CapexAssets				-0.026293	-0.025971
				(0.044681)	(0.044479)
AcaAssets				0.028918**	0.031273**
				(0.012196)	(0.012171)
PPEG <b>r</b> owtht				0.001397***	(01012111)
				(0.000459)	
PPEG <del>r</del> owtht1				(01000.01)	0.000009
					(0.000031)
cons	0.000577	0.003468	0.004325	0.001920	0.001540
	(0.000535)	(0.002938)	(0.003196)	(0.006472)	(0.006468)
Obs	9184	8592	7389	4278	4283
R-squared	0.000013	0.000786	0.000436	0.006901	0.004347
Firm Dummy	YES	YES	YES	YES	YES
Vear Dummy	VES	VES	VES	VES	VES

## Table 16-g: Regression results

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000076	0.000394	0.000185	0.000577	0.000577
	(0.000236)	(0.000241)	(0.000325)	(0.000469)	(0.000469)
LnAssets		-0.015093***	-0.012954***	-0.008386*	-0.008336*
		(0.002548)	(0.002947)	(0.004708)	(0.004704)
Tobinq		0.000084**		0.000068	0.000068
		(0.000033)		(0.000099)	(0.000099)
ROA		0.055340*		0.124843**	0.125097**
		(0.030596)		(0.053539)	(0.053510)
Leverage			-0.007605	-0.011574	-0.011468
~			(0.013312)	(0.022511)	(0.022497)
CashAssets			0.021865	0.024665	0.024898
			(0.020784)	(0.029294)	(0.029270)
RDcapital			· · · · ·	-0.050927	-0.050524
1				(0.163194)	(0.163109)
CapexAssets				0.047830	0.048409
				(0.090430)	(0.090374)
AcqAssets				0.020841	0.021032
				(0.025165)	(0.025060)
PPEGrowtht				0.000115	(0.00_00000)
1112010 # dif				(0.001107)	
PPEGrowtht1				(01001107)	0.000014
11 Eolowulti					(0.000014
CODS	-0.002379**	0.028095***	0.020647***	0.001181	0.000987
_cons	(0.001065)	(0.006370)	(0.007121)	(0.013744)	(0.013734)
Obs	7705	7227	(0.007121)	3625	3629
B squared	0.000015	0.007588	0.004318	0.004773	0.004779
Firm Dummy	0.000015 VES	VES	VES	VES	VES
Voor Dummy	VES	VES	VES	VES	VES
i cai Duinniy	1 0.0	1 5	1 23	1 123	1 E 3

## Table 16-h: Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumConnected	0.000021	0.000313*	0.000122	0.000445	0.000446
	(0.000168)	(0.000168)	(0.000227)	(0.000326)	(0.000326)
LnAssets	. ,	-0.012946***	-0.011625***	-0.007790**	-0.007750**
		(0.001773)	(0.002057)	(0.003268)	(0.003266)
Tobing		0.000070***	· · · · ·	0.000058	0.000058
1		(0.000023)		(0.000069)	(0.000069)
ROA		0.036717*		0.075597**	0.075796**
		(0.021287)		(0.037170)	(0.037150)
Leverage			-0.009405	-0.015650	-0.015564
0			(0.009293)	(0.015628)	(0.015619)
CashAssets			0.012743	0.016065	0.016262
			(0.014508)	(0.020338)	(0.020321)
RDcapital			()	-0.042527	-0.042208
				(0.113299)	(0.113241)
CapexAssets				0.043992	0.044433
				(0.062782)	(0.062744)
AcaAssets				0.016598	0.016732
				(0.017471)	(0.017399)
PPEGrowtht				0.000079	(0.017377)
				(0.000768)	
PPEGrowtht1				(0.000700)	0.000011
					(0.000041)
cons	-0.001329*	0.025388***	0.020888***	0.006885	0.006728
	(0.000756)	(0.004432)	(0.004971)	(0.009542)	(0.009535)
Obs	7705	7227	6186	3625	3629
R-squared	0.000002	0.010917	0.006879	0.005973	0.005979
Firm Dummy	VES	YES	YES	YES	YES
Voor Dummy	VES	VEC	VEC	VES	VEC

## Table 16-i: Regression results

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumCross	0.001172	0.001402	0.001516	0.001842	0.001854
	(0.000887)	(0.000906)	(0.001004)	(0.001437)	(0.001438)
LnAssets		-0.001955	-0.001535	-0.002200	-0.002036
		(0.001661)	(0.001839)	(0.003105)	(0.003106)
Tobinq		0.000010		0.000055	0.000055
		(0.000024)		(0.000076)	(0.000076)
ROA		0.035275*		0.079072**	0.081424**
		(0.019526)		(0.037137)	(0.037148)
Leverage		. ,	-0.005796	0.004129	0.004381
ő			(0.008834)	(0.015535)	(0.015530)
CashAssets			0.003700	0.002906	0.003111
			(0.013455)	(0.019953)	(0.019905)
RDcapital				-0.081965	-0.082629
1				(0.110617)	(0.110655)
CapexAssets				-0.037604	-0.037144
				(0.064538)	(0.064231)
AcaAssets				0.038975**	0.042031**
				(0.017619)	(0.017577)
PPEGrowtht				0.001811***	(0.01/0///)
11 Lorowald				(0.000664)	
PPEGrowtht1				(0.000001)	0.000012
11 Lolowulti					(0.000012)
cons	0.000258	0.001999	0.003253	0.001530	0.002031
_cons	(0.000258	(0.001777	(0.003233)	(0.000388)	(0.002001
Obs	0184	(0.004211)	7380	(0.009366)	(0.009380)
P sourced	0.000215	0.00047	0.000531	0.006448	4205
Eine Dummu	0.000215 VES	0.000947 XTC	0.000551 VES	0.000440 XES	0.004590 VES
Fiffin Dunniny	IES VES	1 ES	1 ES VEC	1 ES	1 ES
i ear Dummy	YES	1 ES	1 ES	1 ES	1 ES

## Table 16-j: Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
NumCross	0.000799	0.001035	0.001064	0.001334	0.001343
	(0.000664)	(0.000635)	(0.000703)	(0.000994)	(0.000995)
LnAssets		-0.001983*	-0.001776	-0.002295	-0.002168
		(0.001164)	(0.001288)	(0.002149)	(0.002150)
Tobing		0.000007	. ,	0.000035	0.000035
*		(0.000017)		(0.000053)	(0.000053)
ROA		0.023153*		0.050092*	0.051915**
		(0.013690)		(0.025700)	(0.025714)
Leverage		· · · ·	-0.004608	0.001532	0.001724
0			(0.006186)	(0.010751)	(0.010750)
CashAssets			0.002810	0.001731	0.001883
			(0.009421)	(0.013808)	(0.013778)
RDcapital				-0.058308	-0.058815
1				(0.076551)	(0.076596)
CapexAssets				-0.026697	-0.026369
				(0.044663)	(0.044461)
AcqAssets				0.028887**	0.031241**
1				(0.012193)	(0.012167)
PPEGrowtht				0.001396***	()
				(0.000459)	
PPEGrowtht1				(******)	0.000009
					(0.000031)
cons	-0.000085	0.002962	0.003883	0.001211	0.000826
	(0.000655)	(0.002952)	(0.003205)	(0.006497)	(0.006493)
Obs.	9184	8592	7389	4278	4283
R-squared	0.000178	0.001124	0.000745	0.007117	0.004565
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

## Table 16-k: Regression results

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumCross	0.001135	0.001810	0.001423	0.003841*	0.003845*
T A	(0.001318)	(0.001344)	(0.001524)	(0.002050)	(0.002049)
LnAssets		-0.014910****	-0.012924	-0.008276*	-0.008225*
Tobing		(0.002342)	(0.002955)	0.004090)	0.004092)
TODHIQ		(0.000065***		(0.000000)	(0.000000)
POA		0.056106*		(0.000099)	0.126700**
KOM		(0.030624)		(0.053520)	(0.053500)
Leverage		(0.030024)	0.008104	0.012618	0.012513
Leverage			(0.013319)	(0.022514)	(0.022500)
CashAssets			0.022283	0.026458	0.026686
Casili issets			(0.020245)	(0.020450	(0.020000
RDcapital			(0.020713)	-0.047340	-0.046931
Riscapitai				(0.163154)	(0.163068)
CapexAssets				0.047548	0.048142
Superi 100000				(0.090350)	(0.090294)
AcaAssets				0.021315	0.021520
				(0.025158)	(0.025054)
PPEG <b>r</b> owtht				0.000123	(0.0-0.00.0)
				(0.001106)	
PPEGrowtht1				· · · ·	0.000014
					(0.000059)
_cons	-0.002975**	0.027327***	0.020063***	-0.000742	-0.000940
-	(0.001276)	(0.006408)	(0.007148)	(0.013799)	(0.013789)
Obs.	7705	7227	6186	3625	3629
R-squared	0.000110	0.007453	0.004419	0.005439	0.005446
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

## Table 16-1: Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
NumCross	0.000926	0.001609*	0.001227	0.002944**	0.002947**
	(0.000936)	(0.000935)	(0.001064)	(0.001423)	(0.001422)
LnAssets		-0.012818***	-0.011639***	-0.007703**	-0.007663**
		(0.001769)	(0.002047)	(0.003260)	(0.003258)
Tobing		0.000070***		0.000057	0.000057
*		(0.000023)		(0.000069)	(0.000069)
ROA		0.037511*		0.076881**	0.077079**
		(0.021306)		(0.037161)	(0.037141)
Leverage		. /	-0.009821	-0.016448	-0.016363
0			(0.009297)	(0.015629)	(0.015620)
CashAssets			0.012951	0.017446	0.017639
			(0.014481)	(0.020322)	(0.020305)
RDcapital				-0.039781	-0.039456
1				(0.113263)	(0.113204)
CapexAssets				0.043748	0.044201
1				(0.062722)	(0.062684)
AcqAssets				0.016960	0.017105
1				(0.017465)	(0.017393)
PPEGrowtht				0.000086	()
				(0.000768)	
PPEGrowtht1				(	0.000011
					(0.000041)
cons	-0.001915**	0.024688***	0.020384***	0.005415	0.005256
-	(0.000906)	(0.004458)	(0.004990)	(0.009579)	(0.009572)
Obs.	7705	7227	6186	3625	3629
R-squared	0.000145	0.010838	0.007071	0.006773	0.006781
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

## Table 16-m: Regression results

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000017	0.000105	0.000248	0.000293	0.000300
	(0.000197)	(0.000203)	(0.000323)	(0.000496)	(0.000496)
LnAssets		-0.001889	-0.001557	-0.002259	-0.002100
		(0.001670)	(0.001859)	(0.003129)	(0.003130)
Tobinq		0.000010		0.000056	0.000056
		(0.000024)		(0.000076)	(0.000076)
ROA		0.034072*		0.078455**	0.080810**
		(0.019515)		(0.037140)	(0.037150)
Leverage		. ,	-0.005150	0.004753	0.005006
č			(0.008834)	(0.015529)	(0.015524)
CashAssets			0.003606	0.002583	0.002782
			(0.013467)	(0.019958)	(0.019910)
RDcapital			· · · ·	-0.082899	-0.083561
L				(0.110635)	(0.110672)
CapexAssets				-0.037910	-0.037446
1				(0.064562)	(0.064253)
AcqAssets				0.038870**	0.041931**
- 1				(0.017626)	(0.017584)
PPEG <b>r</b> owtht				0.001811***	
				(0.000664)	
PPEGrowtht1				(01000000)	0.000011
					(0.000045)
cons	0.000547	0.002737	0.003906	-0.000451	-0.000943
_00115	(0.000692)	(0.004192)	(0.004564)	(0.009352)	(0.009344)
Obs	9184	8592	7389	4278	4283
R-squared	0.000001	0.000667	0.000270	0.006088	0.004029
Firm Dummy	YES	YES	YES	YES	YES
Vear Dummy	VES	VES	VES	VES	VES
i cai Dunniny	1120	1120	110	110	1120

## Table 16-n: Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000016	0.000059	0.000166	0.000167	0.000172
Ŭ	(0.000147)	(0.000142)	(0.000226)	(0.000343)	(0.000344)
LnAssets		-0.001915	-0.001783	-0.002301	-0.002177
		(0.001171)	(0.001302)	(0.002165)	(0.002166)
Tobing		0.000008		0.000036	0.000036
*		(0.000017)		(0.000053)	(0.000053)
ROA		0.022274		0.049616*	0.051440**
		(0.013682)		(0.025703)	(0.025717)
Leverage			-0.004162	0.001994	0.002187
0			(0.006186)	(0.010747)	(0.010746)
CashAssets			0.002759	0.001518	0.001667
			(0.009430)	(0.013812)	(0.013782)
RDcapital			· · · ·	-0.059050	-0.059556
Cocapital				(0.076566)	(0.076611)
CapexAssets				-0.027060	-0.026725
1				(0.044681)	(0.044478)
AcqAssets				0.028767**	0.031126**
1				(0.012198)	(0.012172)
PPEGrowtht				0.001397***	( )
				(0.000459)	
PPEGrowtht1				(******)	0.000009
					(0.000031)
cons	0.000511	0.003494	0.004339	0.001993	0.001614
_	(0.000518)	(0.002939)	(0.003195)	(0.006472)	(0.006468)
Obs.	9184	8592	7389	4278	4283
R-squared	0.000001	0.000797	0.000475	0.006683	0.004128
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	VES	VES

## Table 16-0: Regression results

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000350	0.000793**	0.000738	0.000906	0.000907
LnAssets	(0.000349)	(0.000354) -0.015249***	(0.000565) -0.013234***	(0.000797) -0.008476*	(0.000796) -0.008427*
		(0.002548)	(0.002950)	(0.004717)	(0.004713)
Tobinq		0.000085**		0.000069	0.000069
		(0.000033)		(0.000099)	(0.000099)
ROA		0.054618*		0.123718**	0.123976**
-		(0.030582)		(0.053516)	(0.053487)
Leverage			-0.007398	-0.011230	-0.011125
0.11			(0.013312)	(0.022509)	(0.022495)
CashAssets			0.021283	0.024980	0.025212
			(0.020765)	(0.029290)	(0.029265)
RDcapital				-0.052138	-0.051/41
				(0.163201)	(0.163116)
CapexAssets				0.045839	0.046409
A A				(0.090384)	(0.090528)
AcqAssets				0.020922	0.021111
DDEC souths				(0.025167)	(0.025062)
PPEGIOWUII				(0.000113	
PDEC rowtht1				(0.001107)	0.000013
rrE610wulti					(0.000013
CODE	-0.002707***	0.028296***	0.020626***	0.001556	0.001363
_cons	(0.001033)	(0.006368)	(0.007120)	(0.013736)	(0.013725)
Obs	7705	7227	6186	3625	3629
R-squared	0.000150	0.007957	0.004573	0.004702	0.004708
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES
· ··· · · ·					

# Table 16-p: Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
AvgNum	0.000182	0.000603**	0.000497	0.000597	0.000598
Ũ	(0.000248)	(0.000246)	(0.000394)	(0.000553)	(0.000553)
LnAssets	· · · ·	-0.013052***	-0.011817***	-0.007801**	-0.007761**
		(0.001773)	(0.002059)	(0.003275)	(0.003273)
Tobinq		0.000070***	. ,	0.000059	0.000059
*		(0.000023)		(0.000069)	(0.000069)
ROA		0.036129*		0.074576**	0.074775**
		(0.021277)		(0.037157)	(0.037137)
Leverage			-0.009264	-0.015379	-0.015295
			(0.009293)	(0.015629)	(0.015619)
CashAssets			0.012337	0.016395	0.016590
			(0.014496)	(0.020336)	(0.020319)
RDcapital			. ,	-0.043377	-0.043061
-				(0.113313)	(0.113255)
CapexAssets				0.042150	0.042583
*				(0.062755)	(0.062717)
AcqAssets				0.016615	0.016749
				(0.017474)	(0.017401)
PPEGrowtht				0.000078	. ,
				(0.000768)	
PPEGrowtht1					0.000010
					(0.000041)
_cons	-0.001544**	0.025546***	0.020873***	0.007212	0.007057
	(0.000733)	(0.004431)	(0.004970)	(0.009537)	(0.009530)
Obs.	7705	7227	6186	3625	3629
R-squared	0.000080	0.011312	0.007119	0.005740	0.005745
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

## Table 16-q: Regression results

MktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	0.008288	0.011827	0.011784	0.017328	0.017368
LnAssets	(0.010281)	(0.010588) -0.001856	(0.011663) -0.001409	(0.017201) -0.002103	(0.01/212) -0.001937
		(0.001658)	(0.001836)	(0.003103)	(0.003104)
Tobing		0.000010	(01001000)	0.000056	0.000056
1		(0.000024)		(0.000076)	(0.000076)
ROA		0.034814*		0.079076**	0.081447**
		(0.019523)		(0.037144)	(0.037155)
Leverage			-0.006041	0.004185	0.004438
0			(0.008857)	(0.015540)	(0.015535)
CashAssets			0.003971	0.003081	0.003284
			(0.013455)	(0.019958)	(0.019909)
RDcapital				-0.082238	-0.082909
Î.				(0.110627)	(0.110665)
CapexAssets				-0.037107	-0.036642
_				(0.064560)	(0.064252)
AcqAssets				0.038772**	0.041832**
_				(0.017618)	(0.017577)
PPEGrowtht				0.001813***	
				(0.000664)	
PPEGrowtht1					0.000012
					(0.000045)
_cons	0.000104	0.002126	0.003452	-0.001393	-0.001892
	(0.000842)	(0.004217)	(0.004577)	(0.009397)	(0.009390)
Obs.	9185	8593	7389	4278	4283
R-squared	0.000080	0.000796	0.000337	0.006273	0.004211
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

## Table 16-r: Regression results

LnMktShareGrowt1	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	0.005466	0.008580	0.007965	0.012168	0.012197
	(0.007697)	(0.007423)	(0.008166)	(0.011904)	(0.011915)
LnAssets		-0.001909	-0.001685	-0.002223	-0.002095
		(0.001163)	(0.001286)	(0.002148)	(0.002149)
Tobing		0.000007		0.000035	0.000035
*		(0.000017)		(0.000053)	(0.000053)
ROA		0.022803*		0.050078*	0.051913**
		(0.013688)		(0.025705)	(0.025719)
Leverage			-0.004762	0.001587	0.001779
0			(0.006201)	(0.010754)	(0.010754)
CashAssets			0.003002	0.001850	0.002000
			(0.009421)	(0.013812)	(0.013782)
RDcapital				-0.058530	-0.059042
1				(0.076559)	(0.076604)
CapexAssets				-0.026375	-0.026043
1				(0.044678)	(0.044476)
AcqAssets				0.028736**	0.031092**
1				(0.012193)	(0.012167)
PPEGrowtht				0.001398***	()
				(0.000459)	
PPEGrowtht1				(******)	0.000009
					(0.000031)
cons	0.000172	0.003063	0.004032	0.001331	0.000948
_	(0.000630)	(0.002956)	(0.003205)	(0.006503)	(0.006500)
Obs.	9185	8593	7389	4278	4283
R-squared	0.000062	0.000950	0.000538	0.006908	0.004350
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

## Table 16-s: Regression results

MktShareGrowt3	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	0.004589	0.014160	0.007520	0.037316	0.037454
LnAssets	(0.015129)	(0.015590) -0.014792***	(0.01/446) -0.012798***	(0.024117) -0.008093*	(0.024105) -0.008042*
		(0.002540)	(0.002929)	(0.004695)	(0.004691)
Tobinq		0.000085**		0.000068	0.000068
		(0.000033)		(0.000099)	(0.000099)
ROA		0.055192*		0.126239**	0.126547**
		(0.030613)		(0.053552)	(0.053524)
Leverage			-0.008170	-0.012724	-0.012629
			(0.013362)	(0.022527)	(0.022513)
CashAssets			0.022583	0.026863	0.027088
			(0.020744)	(0.029286)	(0.029261)
RDcapital				-0.048247	-0.047832
				(0.163182)	(0.163096)
CapexAssets				0.047841	0.048475
				(0.090387)	(0.090332)
AcqAssets				0.020877	0.021089
				(0.025161)	(0.025056)
PPEGrowtht				0.000125	
				(0.001107)	
PPEGrowtht1					0.000015
					(0.000059)
_cons	-0.002451**	0.027576***	0.020390***	-0.000418	-0.000626
	(0.001230)	(0.006416)	(0.007146)	(0.013811)	(0.013801)
Obs.	7705	7227	6186	3625	3629
R-squared	0.000014	0.007298	0.004292	0.005067	0.005078
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

## Table 16-t: Regression results

LnMktShareGrowt3	(1)	(2)	(3)	(4)	(5)
TotalCrossOwn	0.005017	0.013425	0.007684	0.028916*	0.029027*
	(0.010742)	(0.010847)	(0.012178)	(0.016743)	(0.016735)
LnAssets		-0.012718***	-0.011537***	-0.007564**	-0.007523**
		(0.001767)	(0.002045)	(0.003259)	(0.003257)
Tobing		0.000070***		0.000058	0.000058
*		(0.000023)		(0.000069)	(0.000069)
ROA		0.036761*		0.076686**	0.076926**
		(0.021299)		(0.037177)	(0.037158)
Leverage		· · · · ·	-0.009956	-0.016542	-0.016465
0			(0.009327)	(0.015639)	(0.015629)
CashAssets			0.013206	0.017765	0.017957
			(0.014480)	(0.020331)	(0.020314)
RDcapital				-0.040449	-0.040120
1				(0.113287)	(0.113228)
CapexAssets				0.044013	0.044497
1				(0.062750)	(0.062712)
AcqAssets				0.016627	0.016777
1				(0.017467)	(0.017395)
PPEGrowtht				0.000087	( )
				(0.000768)	
PPEGrowtht1				(	0.000011
					(0.000041)
cons	-0.001558*	0.024869***	0.020625***	0.005644	0.005477
_	(0.000874)	(0.004464)	(0.004988)	(0.009588)	(0.009581)
Obs.	7705	7227	6186	3625	3629
R-squared	0.000032	0.010614	0.006899	0.006343	0.006355
Firm Dummy	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES

Overall, what can be asserted from our empirical analysis is, first, that the phenomenon of institutional cross-ownership (as well as cross-ownership by each possible type of investor in general, independently of its nature) has undergone a gradual yet remarkable increase in Europe over the time interval from 2001 to 2018, coherently with what found by He and Huang (2017) over a larger time window in the US. Second, the statistics for cross-ownership in the baseline model (5% block thresholds) are substantially in line with the results of our reference paper, which may be a surprise if one starts from the observation that the US stock market and European ones are theoretically and historically largely different in that the first one is marked by highly dispersed ownership structures while the second are characterized by more concentrated ownership patterns. This superficial surprise is then brought to a more reasonable dimension if we think that the stocks within our sample are those representing the largest companies listed in Europe, which might mean that larger dimensions could lead to ownership structures that are more dispersed. Third, the presence of cross-ownership varies significantly across industries but it shows a relevant uniformity over time at single industry level. Besides, there are sectors in which institutional ownership basically constitute approximately 100% of cross-ownership and other sectors in which non-institutional investors' cross-ownership is also numerically relevant. Most importantly, we recognize that, in contrast to He and Huang (2017), there is no significant pairwise correlation between cross-ownership and product market share growth as well as between cross-ownership and operating profit margin. This piece of evidence is confirmed by multiple panel regression models, where the statistical significance of our target variables is negligible. Such results hold independently of the time horizon considered (1 or 3 years), independently of the minimum threshold for defining a block, independently of the cross-ownership measure employed and independently of the wider or narrower perimeter of industries. Finally, the phenomenon of institutional cross-ownership does not show authentically peculiar features per se if compared to cross-ownership in general, thus institutional cross-ownership does not seem to need to be considered separately from non-institutional cross-ownership because non-institutional cross-ownership seem to represent only a marginal portion of the overall cross-ownership phenomenon.

# **Chapter 4: Conclusions**

Our study is focused on institutional cross-ownership in Europe and the effects it may entail in terms of coordination and competition among cross-held companies. Our reference paper, in terms both of empirical methodology and logic behind the analysis, is He and Huang (2017), which specifically targets the phenomenon of institutional crossownership of U.S. public companies in the time interval between 1980 and 2014. We aim at providing an analogous research (even though referred to the time window 2001-2018) for European stocks and, in particular, we are interested in providing an analysis that is not limited to specific niche markets where one may expect anticompetitive issues (because of their peculiar features) but we rather include each possible industry. One crucial point, in that respect, is the precise definition of the perimeter we establish for an industry, as it is liable to modify substantially the computation of our cross-ownership measures. Thus, we decide to employ both Fama-French 12 industry classification (by clustering companies starting from their 4-digit SIC codes) and 4-digit SIC codes directly, in order to provide robustness to our results. For this same purpose and in order to be in line with our reference paper, we utilize 4 cross-ownership measures (computing them for two different block thresholds) and multiple measures for product market share growth as well as one measure for operating profit margin. We adopt both OLS panel regression models and quantile regressions in order to cope with potential deviations of our sample variables distribution from the one assumed by OLS models.

From our empirical analysis, we identified both similarities and differences between the European and U.S. market landscapes. On the one hand, we may recognize a similarity in the gradual yet significant pattern of percentage growth of cross-held public companies in the last decades within both geographic areas. One possible explanation for this

common trend is that the rise of passive investment strategies has similarly affected both areas and it has progressively led to an automatic and, substantially identical, increase in the horizontal holdings by institutional investors. Besides, not only the historical patterns of cross-ownership seem to be overlapping, but also cross-ownership measures in Europe and in the U.S. appear to present akin statistics, despite we refer to slightly different time windows. Overall, both mean and median values are similar in our study with respect to He and Huang (2017) and differences in terms of standard deviation are only minor.

Despite these similarities, once we create two separate groups (cross-held firms versus non-cross-held firms) as in the reference paper and we compare their mean and median values for product market share growth, operating margins and control variables, we do not find He and Huang's straightforward and statistically significant differences between the two samples. To be more precise, we do find some evidence of statistically significant differences between cross-held and non-cross-held companies in terms of control variables but not in terms of product market share growth or operating profitability.

The absence of a statistically relevant connection between institutional cross-ownership (as well as institutional and non-institutional together) and product market performance is then confirmed in the vast majority of the multivariate regression models we utilized and this turn out to be an extremely relevant difference with respect to our reference paper. On the one hand, He and Huang (2017) shows that in the U.S. one can univocally claim that institutional cross-ownership acts as a trigger for improved coordination among cross-held firms, thus entailing a larger product market share growth and a better operating profitability. On the other hand, once we analyze the European stock market, we cannot unambiguously claim that horizontal holdings by institutional investors set the ground for superior coordination. Likewise, we cannot unequivocally state that crossownership is likely to lead to anticompetitive outcomes.

Overall, given that in most of the cases we cannot refuse the hypothesis according to which larger cross-ownership measures are not associated with higher product market share growth or more favorable operating profitability, we may interpret the absence of statistical evidence in different ways. One, probably excessively naïve, explanation may be that institutional investors are interested in exerting influence over cross-held companies but they do not manage to do so. Given the larger and larger ownership percentages cumulated by institutional investors over the last decades and their substantially aligned interests, it would be hard to believe that they actually do not have the power to exert influence over managerial bodies in order to gain benefit from higher coordination among cross-held firms. A more realistic explanation could be that institutional investors are not interested in exerting influence over cross-held companies to improve their competitive position, as institutional investors' stakes in listed companies may be mainly referred to passive investment strategy and thus their only aim remains that to passively and automatically track an index, irrespectively of corporate policies adopted. Even though this explanation might be more plausible than the first one, still it does not help us to understand why the situation is so dramatically different in Europe with respect to the U.S. In fact, it would be fairly unrealistic to believe that institutional investors are interested in exerting influence for coordination purposes in the U.S. stock markets but they do not have such an interest in Europe, thus massively changing their policies from a geographic area to the other one. If we wanted to harmonize the empirical evidence in the U.S. and the absence of empirical evidence in Europe (assuming that institutional investors do not change, in the manner of a chameleon, their

aptitude in the U.S. vis a vis Europe), it would be more probable to believe that product market share enhancements and improvements in terms of operating profitability are not the result of a direct influence exerted by cross-owners but rather an indirect consequence of horizonal holdings, and this indirect and dynamic effect only holds in the U.S., while in European stock markets this situation seems to be fairly static.

Finally, on the basis of our empirical evidence, we do not recognize a straightforward need to intervene from a regulatory point of view on cross-ownership or to introduce adhoc rules to avoid anticompetitive outcomes. Besides, given that the relationship between institutional cross-ownership and competition seem to be differently shaped in Europe vis a vis the US, an hypothetic regulatory intervention on the anticompetitive issues of horizontal shareholdings should not have a global reach but rather be targeted at specific continents.

It seems to be advisable to continue analyzing in particular mergers and acquisitions on a case by case basis in order to evaluate whether the cross-ownership resulting from M&A deals or market share growth changes coming from these same operations do represent a real threat for competition.

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# **APPENDIX 1:** Cross-ownership under current legislation and regulatory proposals

Most of the literature focusing on the evidence of potential anticompetitive outcomes of cross-ownership is ultimately aimed at ascertaining whether there exists a sound regulatory framework in order to tackle the issue, once statistically significant proof of the link is established. If this is not the case, then there would be the need to intervene with a new body of rules and laws. It is thus crucial, besides analysing empirical evidence and the economic theory underlying the phenomenon, to grasp the main lines followed by jurisprudence in addressing the theme. An element that can be anticipated is that the heterogeneity of current evidence on competitive harms is reflected by a heterogeneous debate on legislative grounds.

Despite being a theme that, by nature, affects the same big investment management companies on a cross-national basis, common ownership has been differently addressed by regulators in the United States and EU as well as European national laws. The common elements among different regulatory frameworks are that: common ownership is regulated by means of competition law rather than corporate law; regulators across countries and jurisdictions tend to remain prudent in implementing sharply defined rules against intra-industry multiple minority shareholdings as they generally wait for a comprehensive theory of harm to unveil the precise mechanism by means of which common ownership impairs fair competition. We will next depict the actual regulatory framework in the US, EU and some European nations as well as a set of proposals submitted by academics and a summary of the attitude regulators currently show towards the phenomenon.

## A1.1. Current discipline in the US

In the US, the prevailing line of thought when facing the anti-competitive threats posed by common ownership is the one defended – among the others – by Elhauge (2016), and it is based on the claim that there is no need for new legislation, as the harms associated with this phenomenon can be tackled by US Antitrust Agencies and private parties by resorting to the existing set of laws and practices in the field of competition. In particular, reference provisions are found in Sherman Act18 and Clayton Act19.

## A1.1.1. Section 1 of Sherman Act

Section 1 of Sherman Act classifies as unlawful each and every unreasonable "contract, combination, or conspiracy in restraint of trade", such as price-fixing agreements. Thus, the triggering conditions are the existence of an agreement between two firms or among multiple corporations and the set-in-motion of a restraint on competition having the actual or likely effect of limiting output and increasing price-cost margins, as specified by Areeda and Hovenkamp (2017). Besides, Hovenkamp and Morton (2018) point out that the statute itself does not say anything about whether it exclusively condemns purpose or effects, and naked price fixing should be considered a violation per se of the Act even if a cartel is unsuccessful in raising prices. To clarify how Sherman Act can be invoked in practice in order to tackle common ownership-related misbehaviours, Rock and Rubinfeld (2018) report the following example. Imagine a portfolio manager who works for a fund having a substantial stake in each of the main airline companies active in the US. In 2009, as the US economy was approaching the end of a recession, excess capacity

<sup>&</sup>lt;sup>18</sup> Sherman Antitrust Act (1890) was the most ancient Antitrust Law in US history and it responded to a first attempt by the US Administration to limit monopolies and trusts.

<sup>&</sup>lt;sup>19</sup> Clayton Antitrust Act (1914) was aimed at capturing anticompetitive behaviours in their incipiency by prohibiting specifically defined types of conduct, not deemed to be in the best interests of the competitive landscape.

was gradually vanishing and the portfolio manager started to pressure airlines to restrain their impulse to extend capacity in the face of rising demand. This suggestion, once formulated and translated into a recognizable corporate policy, is precisely a violation of Section 1 of Sherman Act.

According to Capobianco (OECD-2008), before applying this Section the question to be answered is whether the firms under analysis (for the purpose of mergers or acquisitions of non-controlling ownership stakes) are effectively two separate entities, meaning that they are legally capable of entering an agreement, or whether they are instead a single business entity. Though the answer may be immediate and trivial if the object of our analysis is a parent and its entirely owned subsidiary, things get complex when a subsidiary is not directly and wholly owned by a unique entity as well as when there are no subsidiaries under analysis but two (formally) completely separated entities. In those cases, the question to be asked is whether the economic reality remains one of common control and management. On the basis of such a narrowing of the focus of Section 1, the US Courts have ruled that Sherman Act cannot be applied to agreements between two corporations owned by a unique small group of individuals<sub>20</sub>.

To understand further the limitations of Sherman Act in facing common ownership side effects, we may mimic the approach of Rock and Rubinfeld (2018) and design a new example. Suppose the portfolio manager we previously mentioned remained quiet on all airline companies earning calls and also remained passive in interactions with airline executives and directors. Nevertheless, these professionals, on an individual and

 $_{\rm 20}$  Century Oil Tool vs. Production Specialties, (5th Cir., 1984) 737 F.2d 1316 – common ownership by three individuals.

independent basis, came to the conclusion that enlarging capacity is not in their own shareholders' interest and, as a consequence, capacity was maintained but not expanded. The result may be close to the previous scenario, with higher fares being the ultimate outcome, but it would not qualify as a violation of Sherman Act since it would be the manifestation of "conscious parallelism" or "tacit collusion" rather than conspiracy in restraint of trade.

#### A1.1.2. Section 7 of Clayton Act

The capability of US Courts to pursue the anticompetitive behaviours presented in the example above has to be attributed to the application of Section 7 of the Clayton Act, as it prohibits "any stock acquisition that leads to an anticompetitive impact", which can be broadly interpreted as referring to transactions resulting in common ownership and acquisitions of non-controlling stakes in companies.

Clayton Act embraces a different approach with respect to Sherman Act in three main ways:

- it has been traditionally triggered when one firm acquires either the assets or stock of another company, without saying anything on ongoing relationships that do not directly involve an acquisition (it can also be applied to the formation of a joint venture if the vehicle for creating the venture is a stock or an asset acquisition).
- the illegality of a shareholding ordinarily needs to be based on its effects rather than on the mechanics through which they come into place. The Act states: "No person shall acquire, directly or indirectly, the totality or any part of the stock or other share capital or any part of the assets of another person or corporation ...where, in any line of commerce or in any activity or business affecting

commerce in any area of the country, the effect of such acquisition may be substantially to lessen competition, or to promote the creation of a monopoly". The statute does not provide any further requirement on the intent or state of mind behind the acquisition and does not offer a typical path by means of which competition is actually lessened, as noted by Markovits (2014). As a consequence, the illegality of one or more holdings does not require any proof on how exactly ownership changes raise prices or lead to higher concentration. In fact, Hovenkamp and Shapiro (2018) argue that at the time when a horizontal merger's legality is assessed, antitrust agencies may not know whether the resulting corporation or corporations are likely to charge higher prices due to unilateral effects or some sort of cooperative or noncooperative price alignment. In either case, the precise form of interaction does not matter as long as the structural analysis predicts that limitations to competition are likely to occur.

- Clayton Act applies to both complete and partial acquisitions and the same type of economic theory and evidence used in merger analysis justifies using it against horizontal shareholding.

The differences between Sherman Act and Clayton Act may be practically shown through the following example. Suppose an institutional investor purchases first a 20% stake in Alpha Ltd and then a 30% equity participation in Beta Ltd, the two companies being competitors in a concentrated market. Section 1 of Sherman Act may be invoked if the two acquisitions yielded a combination in restraint of trade21. This standard does not

<sup>&</sup>lt;sup>21</sup> For instance, in Northern Securities Co. vs. United States, the Supreme Court recognized an unlawful combination when a single holding company acquired controlling interests in the shares of three previously independent railroads.

require control, but exclusively that the arrangement serves to raise price and reduce output. By contrast, Hovenkamp and Morton (2018) highlight that Section 7 of Clayton Act would be triggered by the Beta Ltd stock purchase and one would then simply need to show that the outcome may be substantially to lessen competition. The statute does not command the challenger to demonstrate that Alpha and Beta are going to fix prices or engage in other collusive policies.

To further explain how this discussion (mainly focused on horizontal mergers) applies to the field of common ownership, we can set out the following example, schematized in a press release by the US Department of Justice22. If State Street buys 10% of United Airlines, such transaction would appear to be neither horizontal neither vertical. On the one hand, the two firms of the example are not competitors, thus no horizontal acquisition exists. On the other hand, they do not stand in a buyer-seller relationship in the product market, thus we cannot talk of a vertical acquisition. However, if State Street purchases then 10% of Delta Airlines, the outcome would be that a single firm holds partial ownership of both United Airlines and Delta Airlines, two competing corporations. As a consequence, the merger analysis would be of a horizontal merger in the airline sector involving partial stock acquisition.

## A.1.1.3. Section 5 of Federal Trade Commission Act and suggestions

In addition to Sherman Act and Clayton Act, Section 5 of the Federal Trade Commission (FTC) Act empowers it to condemn and prosecute "unfair methods of competition". In a litigation that goes back to 1966 (FTC vs. Brown Shoe Co.) The Supreme Court stated

<sup>&</sup>lt;sup>22</sup> Statement of the Department of Justice's Antitrust Division Regarding the Investigation of Hearst Corporation's Proposed Acquisition of Tracking Stock in Medianews Group Inc, Antitrust Division (US Department of Justice), October 25<sup>th</sup> 2007..

that Section 5 does not require any explicit agreement but, nevertheless, courts have generally declined to find violations based on conscious parallelism or collusive behaviours without authentically explicit agreements, as shown by the litigation FTC vs. E.I. Du Pont de Nemours & Co (1984), where the ruling Court declined to find that parallel but not expressly collusive behaviour qualified as violation of Section 5.

The attitude we have just depicted may partly be used to explain why it has been possible for large investment funds to accumulate significant ownership stakes in companies active in the same industry but, most of all, what justifies the substantial absence of Courts ruling against institutional investors for common ownership purposes is the "solely-forinvestment" exemption from Section 7 of Clayton Act. While the general clause requires the plaintiff to show likely effects on competition in order to claim damages because it is assumed that the (actual or potential) shareholder can have active control over the firm, whenever the stockholder does not gain influence over the actions and business conduct of the company the plaintiff must show actual and effective lessening of competition so as to claim damages. According to Elhauge (2016) the "solely-for-investment" clause does not hold when a shareholder does not necessarily acquire control but even simply the ability to influence the actions of the target firm. Likewise, such exemption cannot be invoked if the shareholder can access sensitive information related to the activity or business of the target corporation. Ultimately, the suggestion by Elhauge (2016) consists of using Clayton Act and integrating it with a standard rule which is based on the effect of past or potential transactions on a market's MHHI. Specifically, the author argues that an investigation regarding a stock transaction's impact on competition should be automatically triggered if it results in a delta MHHI above 200 and it takes place in industries marked by a MHHI over 2500. The ways Elhauge define to escape from any responsibility and legal charge would be either not to acquire shares in competing enterprises active in oligopolistic industries or to commit not to vote on those shares. Such proposal has not encountered univocal acceptance by academics: Rock and Rubinfeld (2017) disagree with the narrow interpretation of the "solely-for-investment" exemption and stress that significant uncertainty may derive from differing MHHI interpretations and rapid changes in investment fund portfolios. Besides, Elhauge's proposal does not capture cases where institutional investors have parallel interests, and thus could form stable coalition (the idea is that it would not detect those cases in which individual fund holdings are relatively small but similar ownership patterns across multiple investors may result in competitive harms).

Morton et al. (2016), highlighted that an indiscriminate application of these laws would disrupt the investment management industry, an "industry that many Americans rely on for (often) low-fee, diversified savings".

#### A1.2. Current Discipline in the EU

#### A1.2.1. Merger Regulation 139/2004

Under EU law, the possibility to resort to merger legislation as a way to tackle common ownership concerns is fairly limited because the EU merger control regime cannot traditionally be applied to non-controlling minority shareholdings. In order to fall under the Merger Regulation 139/2004 (and its later amendments), there must be an acquisition of *de jure* or *de facto* control. Whenever the deal includes special rights granted to a certain shareholder (certifying its control over the undertaking), there would be a *de jure* control. If instead there are not special rights, but the situation is such that one investor exercises effective control, there could be a *de facto* control. With respect to this last option, the European Commission expressed concerns in the past for shareholdings in the order of approximately 15% 23. Besides, control (in either form) can arise on a sole basis or a joint basis, the last being verified when two or more firms or institutional investors reach an agreement concerning the decisions of the controlled entity. However, the Commission declared that financial interests of investors do not qualify as a species of joint control, because coalitions of minority shareholders often change24. The scarce flexibility of the Regulation in being applied to common ownership cases lies in the following facts:

- there must be a change of control in an undertaking;
- financial interests cannot be taken as a commonality of interests that is strong enough to be perceived as joint control;
- the Commission cannot order the divestment of an already existing minority shareholding in the context of a merger filing, unless it is strictly considered part of the transaction at hand.

# A1.2.2. Article 101 of TFEU

Another juridical reference in Europe is the Article 101 of the Treaty on the Functioning of the European Union (TFEU), which deals with the "prevention, restriction or distortion of competition within the internal market". In order to apply it, there must be some sort of agreement among the considered companies and, in case of common ownership, there is not automatically the assumption of agreement (not even oral), but this does not itself preclude the existence of an agreement. The Court of Justice for instance, in its judgement

<sup>23</sup> Case IV/967 of 22/09/1997: KLM/Air UK.

 $_{24}$  European Commission Consolidated Jurisdictional Notice under Council Regulation n° 139/2004 on the control of concentrations between undertakings (2008/EC 95/01).

over Philip Morris case, held that the purchase of a minority stake corresponded to an agreement, but, in that case, the acquisition was executed in the context of a share transfer agreement25. However, in case of common ownership, there are usually no share transfer agreements but rather simple stock market transactions because institutional investors (at least in passively managed funds) buy and sell shares of a corporation depending on the amount of money transferred in or out of the ETFs they offer. As a matter of fact, shareholdings are not piled up as blocks through an agreement but in smaller batches via stock market transactions and situations in which shares are purchased with no share transfer agreements are much less likely to be considered agreements, since the counterparty of stock transactions is usually not even known, as pointed out by Platis (2013).

Another condition that must be verified in order to apply Article 101 TFUE is that, if there is an agreement, it also needs to have as its object or effect the restriction of competition. In the Phillip Morris case, to stay consistent, the Court asserted that the acquisition of a minority shareholding can never in itself constitute a limitation to competition but, rather, the actual impact of the transaction has to be scrutinized. 4 situations are outlined in which a minority shareholding may originate anti-competitive outcomes:

- the shareholding induces *de jure* or *de facto* control;
- the agreement makes allowances for the possibility of being reinforced in the future;

<sup>&</sup>lt;sup>25</sup> Cases 142 and 156/84 British-American Tobacco vs. European Commission (1987). A share transfer agreement is a procedure if transferring shares from the vendor to a purchaser company in exchange for shares in the purchaser corporation.

- the agreement creates a framework that could be exploited for commercial cooperation;
- the companies involved in the agreement take into consideration each other's interests when defining their own commercial policy.

In practice, Staahl Gabrielsen et al. (2011) argue that whether undue influence arises from common ownership in the context of Article 101 has to be assessed on a case-by-case basis, taking into consideration the size of shareholdings, special rights of the shareholder and market structure.

#### A1.2.3. Article 102 of TFEU

Article 102 TFEU can also be applied to common ownership as it sets out the framework for the prohibition of abuses of dominance. In such a context, the acquisition of minority shareholdings might be caught by the above prohibition under the condition that one of the two corporations involved in the transaction holds a dominant position. Usually, two situations can be part of the phenomenon. First, the acquired entity has a dominant position, in which case the shareholding must give the acquirer control of the company for Article 102 to be applicable. Second, the acquiring firm has a dominant position, in which case there is no need for the shareholding to originate effective control but, as shown in Gillette case<sub>26</sub>, "some influence" is in itself sufficient for the application of Article 102. A third case would be that neither company holds a dominant position at first, but the acquisition gives rise to a collective dominance (with the assessment on the existence of a collective entity being made from the customer's viewpoint). If, in particular, there are structural links causing collective dominance, the creation of

<sup>26</sup> Cases IV/33,440 (Warner-Lambert/Gillette Others and IV/33,486 (Bic/Gillette and Others).

additional links via minority shareholdings or common ownership may be seen as an illegal way to strengthen the existing dominant position.

The most striking obstacle to an application of Article 102 to common ownership is the requirement itself of a dominant position because, while large institutional investors like BlackRock, Vanguard and State Street are the biggest asset managers, the market is particularly fragmented and it cannot be said that institutional investors are dominant in the same way of an industrial corporation. The only way to apply Article 102 is then through collective dominance and the underlying rationale is that two competing firms, that are already collectively dominant, are driven to strengthen their economic links due to common ownership. This, however, requires two conditions: a pre-existing collective dominance and strengthened economic links. The first condition seems difficult to be satisfied, at least in the main industries that are under scrutiny in academia for common ownership purposes (airlines, banks). Second, if pre-existing dominance could be demonstrated, it would be then necessary to prove that common ownership effectively introduces or reinforces economic connections between competing corporations.

#### A1.2.4. Country-specific discipline

The UK Enterprise Act adopts a wide concept of control, reframing it so as to mean "material influence over the acquired business". The analysis needed to certify its existence rests on two pillars: voting rights and board representation, as emphasized by Burnside (2013). This system can be applied in a straightforward way to the acquisition of minority shareholdings but risks to be unfit for common owners, as they usually do not meet the "material influence" standard.

Under German national law, a transaction is liable to mandatory notification if "the shares, either separately or together with other shares already held by the undertaking, get as far as 25% of the capital or the voting rights of the undertaking". A notification is also needed if a stock acquisition gives the holder the opportunity to "directly or indirectly exercise a competitive significant influence". Overall, this means that there are two thresholds: a quantitative limit (which is not relevant to the situation of common ownership) and a more qualitative one (the significant influence must be established both on the basis of economic dependency and corporate law). As such, what is ultimately required is a set of *de jure* or *de facto* circumstances that provide the minority shareholder with a block on a lasting basis, meaning a type of certain control, which is not likely to be in the hands of common owners.

#### A1.3. Alternative approaches

#### A1.3.1. Setting a hard limit

An alternative regulatory approach consists of setting a hard limit on the levels of common ownership. Morton et al. (2018) solicits the introduction of an ad-hoc rule by Antitrust authorities, which should have generally the following text: "No individual or institutional investor holding shares of more than a single independent firm within an oligopoly may (ultimately, meaning both directly and indirectly) own more than 1% of the market share unless the entity owning stock qualifies as a free-standing index fund that commits, on a stable and incontrovertible basis, to being purely passive". Such rules, under the interpretation of its own creators, is meant to be applied to each fund management firm as a whole and not to the single holdings within a fund. This means that if, for instance, Fidelity runs both active and passive investment vehicles, it cannot be considered a purely passive investor overall. Besides, investment in more than "single

independent firm" is conceived as an investor holding shares in multiple firms whose combined market share overshoots the average per-firm market share in the entire industry. The authors also admit the possibility for some discretion by Antitrust authorities as they would be required to set up and annually update a list of oligopolies to which the policy must apply without being given a quantitative rule on how to define an oligopoly. Further, the definition of "purely passive" is that the fund does not undertake any communication with managers or directors of the firm in the portfolio, that it cast votes proportionately to the remainder of the votes cast during shareholders general meetings, that it trades on the basis of clear, non-discretionary public rules.

The advantages of this approach are that institutional investors can focus on the performance of their portfolio firms rather than on the industry as a whole (thus stimulating competition) and intra-industry diversified funds can still operate under the condition that they do not influence the management of the firm. As a result, investment funds are allowed to compete either on the ability to track an index automatically for the benefit of investors prioritizing diversification or on the stock-picking ability, individual firms' performance and the corporate governance inputs they dispense. Stressing these two aspects, Morton et al. (2018) claim: "our policy would foster enormous social gains by attenuating anticompetitive behaviour while prompting only trivial losses in diversification, and very likely improving corporate governance".

Nevertheless, many critiques have been delivered to this clear-cut proposal and, among them, O' Brien and Waehrer (2017) stress the insufficiency and heterogeneity of current empirical evidence, which would not justify the introduction of a rule per se that is likely to revolutionize the investment management industry. In fact, under the scenario of such a legal intervention, large investment funds may be forced to split up in such a way that individual funds investing in a firm do not surpass the limits set out (with likely increases in management costs). Besides, driving institutional investors to refrain from withinindustry diversification would cancel a multitude of investment products that are aimed at creating value for retail investors, limiting investment management firms' ability to offer a variety of funds organized around different investment strategies.

Defining a rule once for all could also result in the hard limit hitting shades of common ownership that do not result in competition issues, so that the rule might be "overbroad". There would also be significant burden on competition authorities to precisely define on a continuous basis whether limits are surpassed in shares acquisitions and to set the boundaries of an industry (the designation of such list would potentially inspire interest group manipulations).

Furthermore, listed companies are likely to be affected as there might be corporate governance drawbacks (as a result of limitations on index fund voting), with an amplification, for instance, of activist shareholder voice and the consequent orientation of the firm towards short-term, rather than long-term, performance and policies.

Finally, the dynamics of an industry may lead to investors exceeding common ownership limits in a passive way, after the shares purchase. For instance, if a firm closes one of its businesses and exits a market, the market share of the remaining companies in the market would be automatically magnified, which could mean that an investment fund that has previously been compliant with common ownership limits might now exceed these limits. As a consequence, funds would be constrained to continually monitor each and every market in which they have invested so as to ensure that no market changes occur that require shares divestitures, thus creating substantial uncertainty. In addition, not only the market but also the single invested companies have to be closely monitored. For instance, a potential breach may show up if a portfolio firm enters a market that is unrelated to its current activity causing a fund's holdings across this last market to exceed the limits, as highlighted by Baker (2016).

#### A1.3.2. Establishing a "safe harbour" for common ownership

A different solution to counteract anticompetitive outcomes of common ownership and ensure litigation certainty to institutional investors consists of establishing a "safe harbour" for common ownership, a line of thought defended by Rock and Rubinfeld (2017). Specifically, they propose a "control safe harbour" for investors holding 15% or less of the shares of a company, with no representatives on the company's Board of Directors and with no engagement that goes beyond what they call "normal engagement", meaning they do not hold an active stance on subjects such as Board members' selection, compensation package, shareholders' rights. This arbitrary threshold is selected on the basis of an assessment by the authors on the proportion of shares needed by an investor in order to exercise influence over a firm and, in particular, they assert that at least 20% stake is required to choose a Board member and that Antitrust authorities have generally not challenged acquisitions below such a level.

O' Brien and Waehrer (2017) propose instead a safe harbour based on MHHI as a quick and rough gauge of potential anti-competitive impacts when a clear shareholder control structure can be identified or when there is divergence between voting shares and financial ownership. This proposal would reduce monitoring and adjudication costs but risks to be excessively simplistic as it is not clear how this policy would target effectively all behaviours and agreements resulting in competitive harm (the safe harbour may be excessively permissive with institutional investors, which are not used to reach such high levels of ownership, and it would not capture the fact that they may have individual shareholdings of less than 15% in each portfolio company but with combined shareholdings sufficient to exercise influence); the proposed threshold is the same for countries with very different corporate ownership structures, making it easy to implement but hardly effective.

#### A1.3.3. What regulators currently think about common ownership

As the debate goes on, US Antitrust enforcers remain unconvinced that common ownership constitutes an antitrust violation. In a joint statement to the OECD (2018), they stated that the debate is in "its early stage of development" and declined "at this time to make any changes to Department of Justice of FTC policies or practices regarding common ownership by institutional investors". More specifically, at FTC, Commissioner Noah Philips argued (2018) that "the empirics remain unsettled and mutual funds do not appear to be at the apex of a massive antitrust conspiracy, so that the claimed economic blockbuster seems a little light on plot"; at DOJ, the Deputy Assistant Attorney General for Antitrust Barry Nigro (2016) wrote that an Antitrust case against common ownership "is likely to face scepticism in the courts". In December 2018, The US Federal Trade Commission held an articulated hearing on the theme of common ownership which led to strongly negative reactions from investors and index fund providers, while common ownership and its impact on the competitive arena were a key topic at the OECD roundtable discussion at the end of 2017. In EU, common ownership was taken into consideration in two high-profile merger cases, Dow/DuPont (2017) and Bayer/Monsanto (2018), as an "element of context" but the European Commission did not formulate a theory of harm based on stand-alone unilateral or coordinated effects. The EC also did not find any hard evidence on large institutional investors influencing competition but only admitted that "large shareholders do have a privileged access to corporations' management and can therefore share their views and have the possibility to shape companies' management incentives accordingly". The EU Parliament, in the first quarter of 2018, called on the EC to embrace all necessary measures to deal with the potential anti-competitive outcomes of common ownership and to investigate the phenomenon itself and prepare a report particularly on prices and innovation. Competition Commissioner Margrethe Vestager (2018) also confirmed that the EC will continue in the future to investigate how common ownership is shaped in Europe and what are its effects; the EC, in Bayer/Monsanto litigation, recognized that the debate regarding the anticompetitive issues arising from common ownership is "ongoing" and "definitely not yet settled".

#### A1.4. Importance of the regulatory framework for the purpose of our study

Having illustrated the major lines of thinking embraced by regulators and jurisprudence, we can recognize that solid empirical analyses are needed in order for regulators to take an active stance on cross-ownership and that current ad-hoc rules do not precisely define what an oligopoly is. A more comprehensive way to develop the discussion would be to analyse each industry, without previously filtering them by only focusing on those that are claimed to be oligopolies. This is the approach of He and Huang (2017) and it is the one embraced by our study. Only once we have recognized the existence of effective

anticompetitive harms from cross-ownership in a comprehensive analysis we will be in the conditions to reason in regulatory terms.