

## Common Ownership and Entrepreneurship<sup>†</sup>

By OFER ELДАР AND JILLIAN GRENNAN\*

Common ownership of public firms by institutional investors arguably reduces firms' incentives to compete and may cause higher mark-ups for consumers (Azar, Schmalz, and Tecu 2018; De Loecker, Eeckhout, and Unger 2020). A critique of this literature is that the measures of common ownership only account for public firms. Backus, Conlon, and Sinkinson (2020) show that the presence of private firms that compete with public firms may dampen the measures of common ownership, suggesting that existing measures may generate a distorted picture of a decline in competitive incentives over time. Looking at early-stage private firms, Eldar, Grennan, and Waldock (2019) show that common ownership among venture capital (VC) investors is increasing over the same period.

We present two new observations regarding common ownership and entrepreneurial start-ups. The first is that inclusion of high-value start-ups (e.g., unicorns) in common ownership measures may actually increase the aggregate measures of common ownership. The second involves taking a dynamic perspective on the relationship between common ownership of public firms, market competition, and entrepreneurial entry. Building on the findings in Eldar, Grennan, and Waldock (2019), we suggest that common ownership of start-ups may counteract a decline in public firms' incentives to compete. We also suggest that even if public-firm common ownership leads to collusive inefficiency and higher prices, it spurs entry of innovative high-growth start-ups and possibly greater consumer welfare in the long run.

The significance of studying start-ups for the field of common ownership is critical. Given the steady decrease in the number of US public firms and the increase in the supply of private

capital to start-ups, many of today's start-ups rival public firms (Doidge, Karolyi, and Stulz 2017; Ewens and Farre-Mensa 2020). Yet, these start-ups rarely share owners with public firms, as the main investors in start-ups are VC investors that do not generally invest in public firms. A significant number of large start-ups could therefore eliminate the concerns about common ownership to the extent that the measures are inflated because they discount the true number of competitors in each industry. Can the emergence of late-stage start-ups defeat the common ownership hypothesis?

The answer depends critically on the two new observations we highlight. First, consider the importance of common ownership among start-ups in an aggregate measure of common ownership. The percent of start-ups that are commonly owned by the same VC investors has increased from less than 10 percent in 1995 to more than 50 percent in 2018. Thus, common ownership of start-ups in the same industry is nowadays the norm, and there are even laws that protect VC investors from litigation risk if they invest in start-ups that may be competing for the same corporate opportunity.

Importantly, VC investors tend to be much more active than institutional owners of public firms. They typically appoint representatives to start-up boards, have veto rights over important actions, and have the right to receive information (Kaplan and Strömberg 2001, Gompers et al. 2020). Moreover, Eldar, Grennan, and Waldock (2019) show that common ownership is associated with a greater percentage of overlapping directors who sit on the boards of start-ups in the same industry. Therefore, there appears to be a direct mechanism that facilitates the flow of information and possibly even coordination among start-ups. Despite the increase in common ownership of start-ups, we demonstrate the challenges to constructing an aggregate measure of common ownership that includes start-ups.

Second, while public-firm common ownership may decrease incentives to compete, collusive activity and higher markups create

\*Eldar: Duke University (email: [eldar@law.duke.edu](mailto:eldar@law.duke.edu)); Grennan: Fuqua School of Business, Duke University (email: [jillian.grennan@duke.edu](mailto:jillian.grennan@duke.edu)).

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opportunities for new entrants (Stigler 1964). We show conditional correlations that suggest that this entry channel is likely to be economically meaningful. We observe that greater public-firm common ownership is associated with greater VC investment in early-stage start-ups and common ownership of start-ups in the same industry. This suggests that the entry of start-ups, typically commonly owned by VCs, could counteract some of the anticompetitive effects of public-firm common ownership.

### I. Aggregate Measures of Common Ownership

The standard measure of common ownership, the Modified Herndahl-Hirschman Index, requires data on both shareholding and firms' market shares. VC firms tend to hold convertible preferred stocks, which means that they are entitled to fixed payments as creditors but can convert their stake into equity if the value of the start-up increases. This makes it hard to assess their actual shareholding. Likewise, defining market shares, which is already an imperfect exercise,<sup>1</sup> might be more challenging when accounting for start-ups because many of them are prerevenue or small but with the potential to grow rapidly. Thus, these start-ups represent a threat of future competition greater than their current share of sales would indicate.

Moreover, the fact that the owners of these start-ups, VC investors, are not typically owners of public firms means that the near-parallel increase in common ownership in public and entrepreneurial markets (see Figure 1) does not necessarily result in greater aggregate measures of common ownership. It is easy to show this using the simpler measure of common ownership, the GGL (Gilje, Gormley, and Levit 2020), which does not include market shares and focuses on ownership incentives. GGL is defined for each pair of firms ( $A, B$ ) as the extent to which common ownership of investor  $i$  of the competitor firm  $B$  affects its ownership incentives in firm  $A$  given its holdings in both firms and the significance of firm  $A$  in the investor's portfolio. Thus,  $GGL(A, B) = \sum_i a_{i,A} g_{i,A} a_{i,B}$ , where  $a_{i,A}$  is the ownership stake of investor  $i$  in firm  $A$ ,  $g_{i,A}$  is a measure of the significance

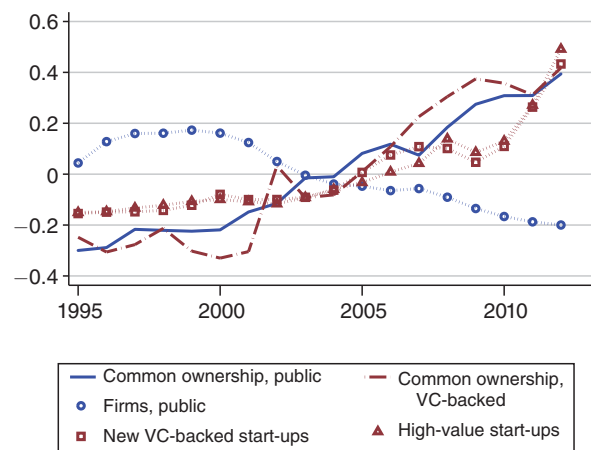


FIGURE 1. TRENDS IN COMMON OWNERSHIP AND FIRM DYNAMICS

Notes: This figure plots common ownership for public firms and VC-backed start-ups from 1995–2012. The circles, triangles, and squares represent total number of firms that are public, start-ups with valuations greater than \$500 million, and start-ups first raising angel, seed, or Series A capital. Series A refers to the first significant round of financing by a VC firm following seed and angel investment (if any). All variables are demeaned and scaled by the corresponding variables' standard deviation to ease interpretation.

Sources: Authors' calculations using data from the Center for Research in Security Prices (2020), Preqin (2019), and S&P Global Market Intelligence (2020)

of firm  $A$  in the investment portfolio of investor  $i$ , and  $a_{i,B}$  is the ownership stake of investor  $i$  in firm  $B$ .<sup>2</sup>

For example, assume that there are only two public firms and one common investor  $i$  and that  $g_{i,A} = g_{i,B} = g_i$ . Then, the average GGL if we only consider public firms is  $GGL_{public} = a_{i,A} g_i a_{i,B}$ . We further assume that there are two start-ups,  $C$  and  $D$  and one VC investor  $j$  and that  $g_{j,C} = g_{j,D} = g_j$ . In this case, the average market GGL that accounts for all firms is  $GGL_{all} = (2a_{i,A} g_i a_{i,B} + 2a_{j,C} g_j a_{j,D}) / 12$ . Thus, in this example,  $GGL_{all} > GGL_{public}$  if  $a_{j,C} g_j a_{j,D} > 5 a_{i,A} g_i a_{i,B}$ .

On the one hand, the stakes in the private market will need to be substantially greater than those in public markets for aggregate GGL to be larger. On the other hand, this is plausibly the case because VC investors tend to have larger stakes in start-ups than institutional owners have

<sup>1</sup>De Loecker, Eeckhout, and Unger (2020) use sales shares by two-digit SIC codes.

<sup>2</sup>Note that  $GGL(B, A)$  explains the common ownership incentives in firm  $B$ , such that for each pair of firms there are two figures.

in public firms, and their shareholding in different start-ups tends to be less diversified (that is,  $g_j > g_i$ ) (Lerner 1995). Accordingly, it is difficult to speculate on whether the aggregate measures of common ownership will be larger or smaller if we account for entrepreneurial firms. In particular, accounting for private firms does not necessarily deflate measures of common ownership, and it may even increase it.

## II. Can Common Ownership of Start-ups Improve Competition?

To assess the impact of common ownership of start-ups, it is not sufficient to simply look at crude measures of common ownership. Rather, it is necessary to examine the nature of such ownership. Common ownership works within entrepreneurial firms differently than it does in public firms. VC firms tend to be active investors with ample industry expertise and business acumen. Eldar, Grennan, and Waldock (2019) find that common ownership of start-ups is associated with overall better outcomes for start-ups, including more rounds of financing, greater likelihood of initial public offerings, and lower probability of failures. The findings are consistent with the idea that information flows between common owners, including through their board representatives, facilitate an efficient allocation of opportunities among start-ups. Although no direct tests of consumer welfare are undertaken, the successful growth associated with common VC investors suggests that it may promote competition by encouraging entrepreneurial activity and that this competition might actually benefit consumers.

In light of these findings, it is possible that common ownership of start-ups may alleviate some of the potential pitfalls of public-firm common ownership. As shown in Figure 1, the number of new rounds of VC financing has increased over the years almost in parallel with public-firm common ownership. If the common ownership hypothesis is true, then in industries where common ownership of public firms is high, these firms are less likely to compete aggressively with one another. Therefore, we would expect to see more tacit collusion and presumably less innovation to benefit consumers. Tacit collusion, however, is not necessarily a stable equilibrium when there is a threat of a new entry. Stigler (1964) first pointed

out that price wars may be the outcomes of new entry into markets in which firms behave anticompetitively. Fershtman and Pakes (2000) further show that an equilibrium path that allows for collusion and entry ultimately generates a less concentrated market structure that offers both more and higher-quality products to consumers, albeit at higher prices.

We suggest that entrepreneurial activity may be a possible way to address the anticompetitive effects of common ownership of public firms. To the extent that common ownership of public firms reduces their incentives to compete with one another, there may be opportunities for entrepreneurial start-ups to step in and disrupt the industry by inventing products that better cater to consumer needs. Moreover, it is possible that VC investors concentrate their activities on areas in which they perceive an opportunity to disrupt an industry because the public firms tend to be dormant and provide products of similar quality and price. If this hypothesis is true, we expect VC common ownership and entrepreneurial activity to be associated over time with measures of public-firm common ownership.

To test this explanation, we merge public-firm common ownership measures with data on VC-backed start-ups from Preqin (2019) from 1995 through 2012. We build a crosswalk that links VC industry definitions with the three-digit standard industrial classification (SIC) definition used by Gilje, Gormley, and Levit (2020) in their development of various common ownership measures. Then, we run ordinary least squares (OLS) regressions that use annual within-industry changes in public-firm common ownership to explain entry of early-stage start-ups as proxied by initial VC financing. The industry and time fixed effects that we include help to account for unobserved heterogeneity across industries and time such as demand shocks and growth opportunities.

Table 1 presents these regression results, including estimated coefficients scaled by the corresponding variables' standard deviation and robust standard errors in parentheses below. To put the estimates in perspective, the number of start-ups receiving Series A VC-financing more than doubles, on average, from 8 start-ups to 21 start-ups in a given industry year in response to a one standard deviation change in public-firm common ownership in the same industry. This marginal effect is smaller than factors such as

TABLE 1—COMMON OWNERSHIP AND ENTREPRENEURIAL ENTRY

	Dependent variable		
	Early-stage VC financing	Series A VC financing	Start-up common ownership
Common ownership (GGL)	0.384 (0.137)	0.355 (0.120)	0.281 (0.077)
Controls	Yes	Yes	Yes
Industry and year FE	Yes	Yes	Yes
Adjusted $R^2$	70%	80%	53%
Observations	764	764	764

*Notes:* This table reports the results of OLS regressions that use annual within-industry changes in common ownership of public firms to explain entry of entrepreneurial start-ups as proxied by their receipt of VC financing between 1995 and 2012. Industry is defined at the three-digit SIC code, and there are 45 unique industries. The primary explanatory variable is the common ownership measure developed in Gilje, Gormley and Levit (2020). Control variables include total public firm count and total market capitalization of public firms as well as industry-level controls for profitability, HHI, Tobin's Q, life cycle stage, leverage, tangibility, payout, investment-to-capital, cash-flow-to-capital, acquisitions, return on equity, share turnover, firm age, sales growth, asset growth, and bankruptcy risk. Robust standard errors are reported in parentheses. All variables are demeaned and scaled by the corresponding variables' standard deviation to ease interpretation.

*Sources:* Authors' calculations using data from Center for Research in Security Prices (2020); S&P Global Market Intelligence (2020); Gilje, Gormley, and Levit (2020); and Preqin (2019)

firm and industry size but larger than a host of other variables like investment, sales growth, and return on equity. Meaningful increases in public-firm common ownership occur across a variety of industries ranging from computer software to biomedicine. Finally, a similar pattern emerges for all early-stage financing, which includes small, initial rounds of financing from seed and angel investors.

Importantly, these conditional correlations are highly robust. We find a positive relation using differing approaches to common ownership measurement suggested by Gilje, Gormley, and Levit (2020) and using lagged measures. Finally, the positive correlation that we observe cannot be explained by other parts of the data-generating process such as controls for total public firm count, total market capitalization of public firms, or industry-level controls for numerous factors, including profitability, Herfindahl-Hirschman Index (HHI), Tobin's

Q, investment-to-capital, return on equity, firm age, sales growth, etc.

The final column of Table 1 shows that the increase in public-firm common ownership is also correlated with an increase in common ownership by VC investors. While not surprising in light of the previous discussion, it does provide additional support for the hypothesis that VC common ownership may mitigate the anticompetitive effects of public-firm common ownership by spurring entrepreneurial activity.

### III. Conclusion

Recent work has highlighted the need to extend the study of common ownership beyond the sphere of public firms. A natural direction is to incorporate common ownership of start-ups, which is pervasive in the VC industry. We show that given the unique attributes of VC common ownership, it may actually increase aggregate measures of common ownership. More importantly, we suggest that as active investors, VCs may pursue a common ownership strategy not only to spur start-up growth but with the goal of disrupting dormant industries where larger firms have limited incentives to compete.

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