4

Common Ownership in Fintech Markets

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I. INTRODUCTION

Is common ownership in fintech companies an empirically significant phenomenon? What impact does it have on competition and innovation in fintech markets and what implications does it carry for competition law enforcement? This chapter studies these questions, providing evidence and insights regarding the extent of common shareholdings held by different types of investors in different types of firms and the likely concerns in selected fintech market segments and countries. It also comments on how the specific ownership and governance structures of fintech firms may materially influence the magnitude and systemic nature of effects associated with common ownership.

Fintech markets differ in a number of important ways from traditional markets, which are usually less dynamic. Fintech firms are seldom publicly listed companies, for which the common ownership phenomenon has been more extensively empirically studied. This affects the empirical and theoretical dimensions of potential competitive effects. On the other hand, it also creates distinct challenges and opportunities for competition law enforcement, which have thus far been under-theorised and under-appreciated. By shedding light on these novel issues surrounding common ownership in fintech as well as the complex relationships between fintech competition, innovation and investment, this chapter aims to deepen the analysis of the implications of common ownership for the operation of firms and markets. As such, it also aims to provide useful guidance to antitrust policymakers for appropriate future action.

The structure of the chapter is as follows. Section II presents empirical evidence on the extent of common ownership in fintech markets across various types of firms, investors and countries. Section III studies the potential impact of common ownership on fintech firms' behaviour and market competition. Section IV discusses the implications of the findings for competition law enforcement. Section V concludes by summarising the key takeaways of the chapter.

II. COMMON OWNERSHIP IN FINTECH MARKETS

Common ownership, the simultaneous ownership of minority shares in competing firms by institutional investors, has recently been the subject of novel economic theory and empirical studies suggesting potential effects on competition and innovation.[1] Most empirical evidence gathered thus far focuses on US markets and publicly listed firms, in which a small group of large institutional investors such as mutual and index funds have extensive common shareholdings.[2] The issue has gained significant attention given the meteoric rise of index funds and their asset managers – the so-called 'Big Three' (BlackRock, Vanguard, State Street) – in light of the recent increasing growth of portfolio diversification and passive investment strategies.[3] Scholars have specifically linked the recent rapid and significant increase in common ownership in public markets to the enormous success of passive index funds as an easier and cheaper means of portfolio diversification and the dramatic growth of (quasi) indexing, including index-tracking exchange-traded funds (ETFs) and quasi-indexer mutual funds.[4] In turn, this unprecedented capital concentration has triggered discussions about the potential implications for competition and consumers of institutional common ownership in multiple rival firms within the same industry (and often the largest ones).[5]

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[1] Organisation for Economic Co-operation and Development (OECD), 'Common Ownership by Institutional Investors and Its Impact on Competition' (2017) DAF/COMP(2017) 10 (summarising the literature).

[2] J Azar, MC Schmalz and I Tecu, 'Anticompetitive Effects of Common Ownership' (2018) 73 *Journal of Finance* 1513; J Azar, S Raina and M Schmalz, 'Ultimate Ownership and Bank Competition' (2022) 51 *Financial Management* 227; M Torshizi and J Clapp, 'Price Effects of Common Ownership in the Seed Sector' (2019) 66 *Antitrust Bulletin* 1; M Backus, C Conlon and M Sinkinson, 'Common Ownership and Competition in the Ready-to-Eat Cereal Industry' (2021) NBER Working Paper 28350; A Banal-Estañol, M Newham and J Seldeslachts, 'Common Ownership in the US Pharmaceutical Industry: A Network Analysis' (2021) 66 *Antitrust Bulletin* 68; J Xie, 'Horizontal Shareholdings and Paragraph IV Generic Entry in the US Pharmaceutical Industry' (2021) 66 *Antitrust Bulletin* 100.

[3] LA Bebchuk and S Hirst, 'The Specter of the Giant Three' (2019) 99 *Boston University Law Review* 721; J Azar, 'The Common Ownership Trilemma' (2020) 87 *University of Chicago Law Review* 263.

[4] Azar, 'The Common Ownership Trilemma' (n 3); J Fichtner, EM Heemskerk and J Garcia-Bernardo, 'Hidden Power of the Big Three? Passive Index Funds, Re-Concentration of Corporate Ownership, and New Financial Risk' (2017) 19 *Business and Politics* 298; J Harford, D Jenter and K Li, 'Institutional Cross-Holdings and their Effect on Acquisition Decisions' (2011) 99 *Journal of Financial Economics* 27; M Backus, C Conlon and M Sinkinson, 'Common Ownership in America: 1980–2017' (2021) 13 *American Economic Journal: Microeconomics* 273; JC Coates, 'The Future of Corporate Governance Part I: The Problem of Twelve' (2018) Harvard Public Law Working Paper No 19-07. Azar, ibid, 269 and Fichtner et al, ibid, 304 note that more than 80% of the equity assets of each of the Big Three asset managers comprises of index funds. According to Azar, it is this that has led to the Big Three's growth and concentration, which collectively have an 81% share of index funds assets, and their extensive common shareholdings in almost all publicly listed firms in the US.

[5] OECD, 'Common Ownership by Institutional Investors' (n 1); Federal Trade Commission, 'US FTC Hearings on Competition and Consumer Protection in the 21st Century, Panel #8: Common Ownership' (6 December 2018).

However, common ownership is a broader phenomenon that is not limited to a specific type of common shareholders, such as the Big Three, or to a specific type of commonly held firms, such as publicly traded companies or firms in direct competitive relationship.[6] But so far, there has been little evidence provided on common ownership in private or closely held companies, which is the most common form for start-ups and fintech firms. Although the presence of large investment funds is less pronounced in countries outside the United States, there is emerging evidence that common shareholding is as prevalent in Europe and Australia, making politicians and competition law policymakers attentive to the evolution and impact of this new phenomenon.[7] It is also well understood that the (degree of) common ownership and its likely effects may vary across different markets[8] and depend on the type of common (and non-common) investors and commonly held firms, ie, the specific ownership and governance structures in place in each individual case.[9] Importantly, common ownership has been shown to have potentially opposing effects on competition (negative) and innovation (positive) within a given industry (intra-industry) and further potential beneficial effects across industries (inter-industry).[10]

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[6] A Tzanaki, 'Varieties and Mechanisms of Common Ownership: A Calibration Exercise for Competition Policy' (2022) 18 *Journal of Competition Law & Economics* 168; J Azar and X Vives, 'Revisiting the Anticompetitive Effects of Common Ownership' (2022) European Corporate Governance Institute – Finance Working Paper No 827/2022.

[7] N Rosati et al, 'Common Shareholding in Europe' (Publications Office of the European Union 2020) EUR – Scientific and Technical Research Reports (JRC121476); S Frazzani et al, 'Barriers to Competition through Joint Ownership by Institutional Investors' (2020) Study for the Committee on Economic and Monetary Affairs, European Parliament, Luxembourg; N Rosati, P Bomprezzi and M Martinez Cillero, 'Institutional Investors and Common Ownership in the European Energy Sector', available at: papers.ssrn.com/abstract=4046563; Monopolkommission, 'Hauptgutachten XXIV: Wettbewerb 2022' (5 July 2022); Monopolkommission, 'Biennial Report XXII: Competition 2018' (3 July 2018); Competition and Markets Authority (CMA), 'State of UK Competition Report 2022' (29 April 2022); Note by the United Kingdom, 'OECD Roundtable on Common Ownership by Institutional Investors and its Impact on Competition' (2017) DAF/COMP/WD(2017) 92; Parliament of the Commonwealth of Australia, 'Report on the Implications of Common Ownership and Capital Concentration in Australia' (2022) House of Representatives Standing Committee on Economics.

[8] MC Schmalz, 'Recent Studies on Common Ownership, Firm Behavior, and Market Outcomes' (2021) 66 *Antitrust Bulletin* 12; M Patel, 'Common Ownership, Institutional Investors, and Antitrust' (2018) 82 *Antitrust Law Journal* 279; J Seldeslachts, M Newham and A Banal-Estañol, 'Changes in Common Ownership of German Companies' (2017) 7 *Economic Bulletin – DIW Berlin* 303; O Eldar, J Grennan and K Waldock, 'Common Ownership and Startup Growth' (2020) Duke Law School Public Law & Legal Theory Series No 2019-42.

[9] MC Schmalz, 'Common-Ownership Concentration and Corporate Conduct' (2018) 10 *Annual Review of Financial Economics* 413; Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6); J Azar and A Tzanaki, 'Common Ownership and Merger Control Enforcement' in I Kokkoris and C Lemus (eds), *Research Handbook on the Law and Economics of Competition Enforcement* (Edward Elgar Publishing, 2022); CS Hemphill and M Kahan, 'The Strategies of Anticompetitive Common Ownership' (2020) 129 *Yale Law Journal* 1392.

[10] ÁL López and X Vives, 'Overlapping Ownership, R&D Spillovers, and Antitrust Policy' (2019) 127 *Journal of Political Economy* 2394; M Antón et al, 'Innovation: The Bright Side of Common Ownership?' (2018) IESE Working Paper, available at: papers.ssrn.com/abstract=3099578; Azar and Vives, 'Revisiting the Anticompetitive Effects of Common Ownership' (n 6); J Azar and X Vives, 'General Equilibrium Oligopoly and Ownership Structure' (2021) 89 *Econometrica* 999.

Some economic studies present an empirical account of common ownership in the banking sector in a number of important jurisdictions with different characteristics.[11] There is also some very limited scholarship on the magnitude and implications of common shareholding among fintech firms associated with ride-sharing platforms with overlapping investors in Southeast Asia.[12] However, there is no systematic or comprehensive account of the extent of common ownership in fintech markets more generally. Providing this is the aim of this chapter.

A. The Global Fintech Landscape

The empirical analysis that follows focuses, for the most part, on start-ups and private fintech companies, which represent the vast majority of the fintech firms worldwide[13] and have not yet been subject to rigorous study regarding the state of common ownership. For completeness and comparison, this analysis is supplemented with data on a smaller sample of fintech firms that have successfully gone public following an initial public offering (IPO) and are present in public markets.

We gathered data for the analysis from the Crunchbase database (as of February 2022). Crunchbase is one of the most popular databases used for the analysis of venture capital (VC) and private equity investments. Since most of the fintech companies that we analysed are private, this database can provide us with the richest information about the equity investments in such firms. We collected information about all companies with the industry classified as 'fintech' and the earliest company formed dating back to 1995. The company data contain name, date of founding, location, product market description, activity status (active or closed), as well as estimates of revenue and number of employees. In addition, we collected information about all the financing rounds received by these companies, showing round-by-round funding amounts each company had raised and the investors that participated in each round. The information we obtained about investors includes names, location and type (VC, angel, private equity, corporation, etc). The analysis only includes fintech companies classified as active and for which there were data on financing rounds and participating investors that allowed us to identify common owners and estimate investors' ownership shares. Overall, our data contains information about equity financing in almost 6,800 fintech companies from 113 countries. Note that fintech companies in our analysis are young, with nearly 90 per cent of the fintech companies in our sample founded after 2010 and almost 50 per cent of companies founded after 2016.

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[11] A Banal-Estañol, N Boot and J Seldeslachts, 'Common Ownership Patterns in the European Banking Sector – The Impact of the Financial Crisis' (2022) 18 *Journal of Competition Law & Economics* 135; Azar, Raina and Schmalz (n 2).

[12] S Van Uytsel, 'Horizontal Shareholding Among Fintech Firms in Asia: A Preliminary Competition Law Assessment' in M Fenwick, S Van Uytsel and B Ying (eds), *Regulating FinTech in Asia: Global Context, Local Perspectives* (Springer, 2020).

[13] According to Crunchbase data.

Figure 1a shows the countries included in the analysis ranked by the total number of fintech companies. The largest fintech market by the number of companies is the United States (2,375), followed by the United Kingdom (765), China (400), India (380) and Canada (215). Figure 1b shows the total amount of capital invested in fintech companies in these countries. Again, the United States is the largest market ($99.1 billion), followed by China ($45.3 billion), the United Kingdom ($29.4 billion), India ($17.5 billion) and Germany ($9.1 billion). If Europe is taken as a whole, it will be the second largest market in both figures with 1,820 fintech firms and $54 billion invested.

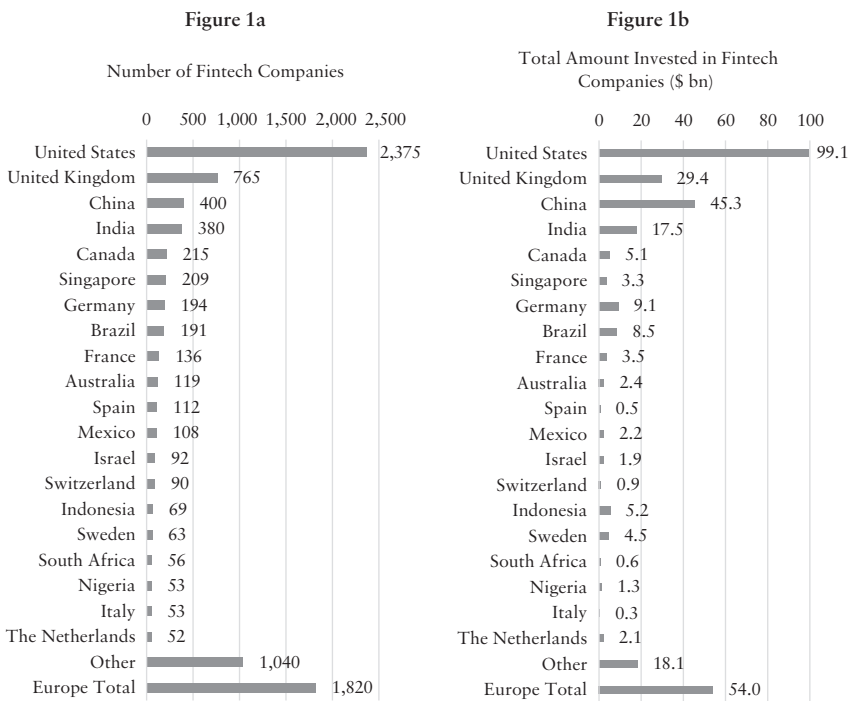**Figure 1** Number of fintech companies and amounts invested in them, by country

Figure 1a

Number of Fintech Companies

United States	2,375
United Kingdom	765
China	400
India	380
Canada	215
Singapore	209
Germany	194
Brazil	191
France	136
Australia	119
Spain	112
Mexico	108
Israel	92
Switzerland	90
Indonesia	69
Sweden	63
South Africa	56
Nigeria	53
Italy	53
The Netherlands	52
Other	1,040
Europe Total	1,820

Figure 1b

Total Amount Invested in Fintech Companies ($ bn)

United States	99.1
United Kingdom	29.4
China	45.3
India	17.5
Canada	5.1
Singapore	3.3
Germany	9.1
Brazil	8.5
France	3.5
Australia	2.4
Spain	0.5
Mexico	2.2
Israel	1.9
Switzerland	0.9
Indonesia	5.2
Sweden	4.5
South Africa	0.6
Nigeria	1.3
Italy	0.3
The Netherlands	2.1
Other	18.1
Europe Total	54.0

Table 1 shows the top 10 investors, ranked by the share of total dollar invest-ment in fintech companies worldwide.[14] The columns show each investor's name, type, the number of fintech companies in which the investor has minority

[14] The ranking of top investors worldwide (Table 1) and the rankings by country (Table 2 and Table 3) presented later are based on estimated ownership of investors according to the method described in section III.B. Due to differences in how some financing rounds' details are recorded in different databases, the estimations of the dollar amounts invested and the calculated ranks occasionally differ from the presented estimates when datasets other than Crunchbase are used. Importantly, the main conclusions drawn from the presented results are not affected by such poten-tial discrepancies.

ownership, and the percentage of capital contributed by the investor in the total amount invested in fintech companies worldwide. The total number of fintech companies with minority ownership represents the number of unique fintech companies in which at least one of the top 10 investors holds shares (the reported investors can hold minority shares in the same firms). As can be seen in this table, the overwhelming majority of the largest global investors in fintech are VC or private equity firms. However, we can also observe JP Morgan among the largest investors in fintech companies, suggesting that established financial institutions such as investment banks are also active in the financing of young innovative fintech companies.

Table 1 Top 10 fintech investors worldwide

Investor name	Investor type	Number of fintech companies with minority ownership	Investor's share of total worldwide $ investment %
Softbank	Venture capital	70	2.39
Sequoia	Venture capital	115	2.07
Tiger Global Management	Private equity firm	102	1.48
Temasek Holdings	Private equity firm	26	1.10
GIC	Private equity firm	25	1.04
JP Morgan	Investment bank	49	0.99
The Carlyle Group	Private equity firm	10	0.99
General Atlantic	Private equity firm	24	0.96
Ribbit Capital	Venture capital	61	0.93
Warburg Pincus	Private equity firm	14	0.82
Total		**382**	**12.77**

Figure 2 illustrates the share of dollar investment in fintech companies worldwide by investor category. This illustration confirms that the largest financial investors in fintech start-ups, which are typically early-stage private companies, are venture capitalists and private equity investors. However, other investor types, such as investment banks, angels and corporate VC units, also have an important presence in the fintech industry. At the same time, it is also notable that large asset managers such as the Big Three in the United States represent a minor share of investments in fintech start-ups worldwide (around 2 per cent in total). That is, large asset managers may invest in small private fintech companies through their active investment portfolios and are found here to do

so to a limited extent. The market conditions (illiquidity of assets, frictions, lack of perfect public information regarding start-up valuation) as well as legal constraints (restrictions on the level and type of pension fund investments) in private markets may explain the low percentage of this group of institutional investors in common shareholdings in privately held fintech firms.[15] Besides, the total investment share and common ownership by the Big Three asset managers in private fintech firms is unlikely to have the systemic character or extensive scope they are observed to have in publicly listed firms (including fintech) for yet another reason: by definition, passive index funds, which represent the vast majority of the assets under management of the Big Three, exist only in the context of public capital markets.[16]

Nevertheless, one should note that our data may underestimate the extent to which large asset management firms invest in fintech companies as such investors often engage in private equity markets indirectly, ie, through participation in VC and private equity funds as limited partners. This means that these institutional investors may provide capital to the funds but are not participating in their management. For example, according to data in Pitchbook, a popular database on private equity investments, Blackrock has acted as a limited partner in nearly 80 VC and private equity funds since 2001. Most of these funds include between 20 to 200 other limited partners, depending on fund size, and such limited partners' investments are passive. Thus, as a rule (to retain their limited liability status) limited partners shall not participate in the funds' day-to-day activities or actively influence the funds' portfolio companies.[17] Yet, in recent years, large asset management firms have started directly investing in private markets, typically by participating in the later stages of VC financing. According to our Crunchbase dataset, Blackrock invested in 20 fintech companies and State Street in four, whereas the Vanguard Group has not invested in fintech companies as a direct investor. However, the number of investments in private early-stage firms by asset managers, including in industries other than fintech, has been growing quickly in the last three years. Therefore, it is expected that the share of traditional large asset managers as fintech investors will increase in the coming years.

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[15] OECD, 'Annual Survey of Investment Regulation of Pension Funds and Other Pension Providers' (2021), available at: www.oecd.org/finance/private-pensions/annualsurveyofinvestmentregulationof-pensionfunds.htm.

[16] See above (n 4).

[17] M Steindl, 'The Alignment of Interests between the General and the Limited Partner in a Private Equity Fund – The Ultimate Governance Nut to Crack?' Harvard Law School Forum on Corporate Governance (11 March 2013), available at: corpgov.law.harvard.edu/2013/03/11/alignment-of-general-and-limited-partner-interests-in-pe-funds/; W Magnuson, 'The Public Cost of Private Equity' (2018) 102 *Minnesota Law Review* 1847.

Figure 2 Fintech investment by investor category worldwide
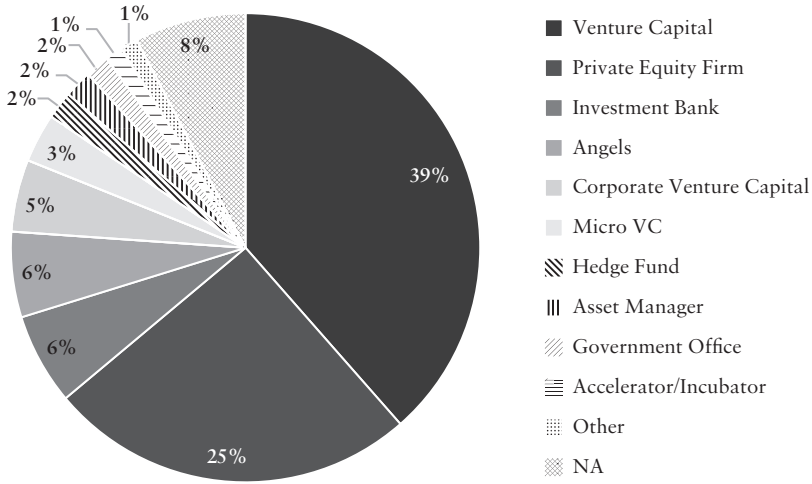
B. Top Common Investors in Fintech by Country

In this section, we provide more granular data on the fintech investment land-scape broken down by country and region. Table 2 below reports the top 10 investors in each country, focusing on a selection of European markets (the United Kingdom, Spain, Sweden, Ireland). The columns show each investor's name, type, the number of fintech companies in which the investor has minor-ity ownership, and the percentage of capital contributed by the investor in the total amount invested in fintech companies in the country. Investors are ranked based on the proportion of total dollar investment in fintech companies in the country.

In most European markets, private equity and VC are the largest and most common fintech investors. The notable outlier is Ireland, where the govern-ment has a very strong presence as a common investor of fintech companies, and investment banks also provide a considerable share of investment. Of the four European fintech markets that we have presented in detail, Ireland has the highest aggregated share of top 10 investors that provide financing in the country's fintech market. The United Kingdom has the lowest collective share of top 10 investors' fintech financing, with some common ownership observed. Blackrock is present in Sweden among the largest investors, but with investments in only two fintech companies. All in all, the number of fintech companies that are commonly held by each of the top 10 fintech investors in each of the four markets is limited.

Table 2 Top 10 fintech investors by country (European markets)

Investor name	Investor type	Number of fintech companies with minority ownership	Share of total country's investment %
UK			
Tiger Global Management	Private equity firm	9	3.35
Motive Partners	Private equity firm	2	2.47
CPP Investments	Asset manager	1	2.38
Softbank	Venture capital	5	1.91
Accel	Venture capital	11	1.75
DST Global	Private equity firm	4	1.42
GIC	Private equity firm	2	1.21
Target Global	Venture capital	5	1.20
Toscafund Asset Management	Hedge fund	2	1.08
Capability and Innovation Fund	Government office	16	1.08
Total		**43**	**17.86**
Spain			
Prime Ventures	Venture capital	1	7.42
Rinkelberg Capital	Venture capital	1	4.70
Credit Suisse	Investment bank	1	4.70
Crowdcube	Venture capital	9	4.37
ING Group	Investment bank	1	3.86
National Health Forecast (PSN)	Corporate venture capital	1	3.86
Greycroft	Venture capital	1	2.73
Spark Capital	Venture capital	1	2.51
All Iron Ventures	Venture capital	2	1.87
Encomenda VC	Micro VC	6	1.66
Total		**19**	**37.66**
Sweden			
Commonwealth Bank of Australia	Corporate venture capital	1	7.00
Northzone	Venture capital	3	4.18

Table 2 *(Continued)*

Investor name	Investor type	Number of fintech companies with minority ownership	Share of total country's investment %
HMI Capital	Venture capital	2	3.47
BlackRock	Asset manager	2	2.91
Chrysalis Investments	Venture capital	1	2.91
Dragoneer Investment Group	Private equity firm	1	2.59
Alma Mundi Ventures	Venture capital	1	2.35
WestCap	Private equity firm	1	2.35
Softbank	Venture capital	1	2.35
Raison Asset Management	Private equity firm	1	2.35
Total		**5**	**32.46**
Ireland			
Allied Irish Banks	Investment bank	1	16.56
ING Group	Investment bank	1	11.52
Enterprise Ireland	Government office	23	8.92
Frontline Ventures	Venture capital	2	6.36
Disruptive Technologies Innovation Fund	Government office	1	5.20
Act Venture Capital	Venture capital	2	3.34
Trinity Ventures	Venture capital	1	3.34
Covid-19 Credit Guarantee Scheme	Government office	1	2.86
Octopus Ventures	Venture capital	1	2.74
Lifeline Ventures	Micro VC	1	2.01
Total		**29**	**62.87**

Table 3 presents the top 10 investors in other selected countries outside Europe (the US, Brazil, China, Indonesia). The columns show each investor's name, type, the number of fintech companies in which the investor has minority ownership, and the percentage of capital contributed by the investor in the total amount invested in fintech companies in the country. Again, investors are ranked based on the proportion of total dollar investment in fintech companies in the country.

The total number of fintech companies with minority ownership represents the number of unique fintech companies in which at least one of the top 10 investors holds shares (the reported investors can hold minority shares in the same firms).

The US has the lowest collective investment share of its 10 largest investors (11.04 per cent). On the other hand, all top US fintech investors have a large number of common shareholdings, and each of them holds minority shares in at least 10 fintech companies. In contrast, the other markets are considerably more concentrated when looking at the top 10 investors' total share of the country's fintech financing. But they have rather limited common ownership considering the number of rival fintech companies in which those largest investors hold minority interests. One noteworthy exception is the VC firm Sequoia in China, with 22 investments in fintech companies. Again, the largest and most common categories of fintech investors are venture capitalists and private equity firms. At the same time, we also observe some large investment banks among the top fintech investors. Distinctively, in Indonesia, corporate VC has a significant presence.

In addition, we can observe from Table 2 and Table 3 that the reported top investors often do not hold minority shares in the same group of firms (ie they have limited company overlaps). Both tables show that the total number of unique fintech companies with minority ownership by at least one of the top investors in most cases significantly exceeds the number of fintech companies held by each of the top investors. For instance, as Table 2 shows, in the United Kingdom, 43 unique companies have minority ownership by at least one of the top 10 investors, while the largest number of companies held by an individual investor (Capability and Innovation Fund) is 16. This is unlike public markets where several large asset management firms tend to have common minority shareholdings in virtually all companies comprising the same index of publicly listed firms (ie, they have extensive if not perfect company overlaps).

Table 3 Top 10 fintech investors by country (other markets)

Investor name	Investor type	Number of fintech companies with minority ownership	Share of total country's investment %
United States			
Sequoia	Venture capital	37	1.88
Tiger Global Management	Private equity firm	36	1.52
Andreessen Horowitz	Venture capital	56	1.32
Ribbit Capital	Venture capital	29	1.30
Softbank	Venture capital	24	1.07

(continued)

Table 3 *(Continued)*

Investor name	Investor type	Number of fintech companies with minority ownership	Share of total country's investment %
DST Global	Private equity firm	16	0.89
Coatue	Private equity firm	27	0.82
Insight Partners	Private equity firm	22	0.79
ICONIQ Capital	Private equity firm	10	0.75
Accel	Venture capital	34	0.71
Total		**218**	**11.04**
Brazil			
JP Morgan	Investment bank	2	23.83
Advent International	Private equity firm	1	5.07
Softbank	Venture capital	6	4.29
Propel Venture Partners	Venture capital	2	4.22
Goldman Sachs	Investment bank	4	3.56
MSA Capital	Private equity firm	1	2.95
Berkshire Hathaway	Investment bank	1	2.95
Sands Capital Ventures	Private equity firm	1	2.95
Kaszek	Venture capital	12	2.79
Ribbit Capital	Venture capital	7	2.30
Total		**26**	**54.88**
China			
Sequoia	Venture capital	22	4.66
China Creation Ventures (CCV)	Venture capital	2	4.62
The Carlyle Group	Private equity firm	2	4.49
Warburg Pincus	Private equity firm	2	3.27
Credit Suisse	Investment bank	3	3.25
General Atlantic	Private equity firm	2	3.25
GIC	Private equity firm	3	3.21
Primavera Capital Group	Private equity firm	5	3.19
Khazanah Nasional	Private equity firm	2	3.18
Temasek Holdings	Private equity firm	2	3.16
Total		**29**	**36.29**

Table 3 *(Continued)*

Investor name	Investor type	Number of fintech companies with minority ownership	Share of total country's investment %
Indonesia			
Alibaba Group	Corporate venture capital	2	28.12
Softbank	Venture capital	5	9.09
EV Growth	Venture capital	5	7.42
Sinar Mas Group	Corporate venture capital	1	3.83
Google	Corporate venture capital	1	3.36
Temasek Holdings	Private equity firm	1	3.36
The Silverhorn Group	Venture capital	1	2.40
Sequoia	Venture capital	7	2.31
SCB Group	Corporate venture capital	1	1.92
Ant Group	Corporate venture capital	1	1.92
Total		13	63.72

Table 4 below shows the combined share of dollar fintech investments by the top 10 investors in each country, for a wide variety of countries. The columns show the country, the total number of fintech companies in the country and the total share of dollar investment in fintech companies by the top 10 investors. Only countries with at least 30 fintech companies in our data are reported. Countries are ranked by the number of fintech companies within each geographical area (ie, Europe, Americas, Asia, Australia, Middle East, Africa).

Table 4 Combined investment share of 10 largest investors

Country	Number of fintech companies in the country	Top 10 investors' combined ownership in country's fintechs %
Europe		
UK	765	17.86
Germany	194	23.36
France	136	27.07

Table 4 *(Continued)*

Country	Number of fintech companies in the country	Top 10 investors' combined ownership in country's fintechs %
Spain	112	37.66
Switzerland	90	34.49
Sweden	63	32.46
Italy	53	55.71
The Netherlands	52	62.61
Ireland	46	62.87
Estonia	40	56.55
Denmark	31	66.05
Americas		
US	2,375	11.04
Canada	215	24.48
Brazil	191	54.88
Mexico	108	45.08
Colombia	48	41.64
Chile	38	54.29
Argentina	37	61.81
Asia		
China	400	36.29
India	380	33.87
Singapore	209	20.81
Indonesia	69	63.72
Japan	50	51.41
South Korea	42	68.52
Australia	119	36.11
Middle East		
Israel	92	25.30
United Arab Emirates	52	46.02
Turkey	35	69.91
Africa		
South Africa	56	44.09
Nigeria	53	60.01
Kenya	34	73.76

The main conclusion that may be drawn from Table 4 is that across the three leading regions (Europe, Americas and Asia), a higher combined investment share by top 10 investors is observed in those fintech markets where the number of fintech companies is smaller. It is also interesting to note that as Table 2 and Table 3 illustrate, the level of dollar investment by each of the top 10 fintech investors across countries does not necessarily correlate with the number of companies in which they have common shareholdings. This may be explained by the fact that larger dollar investments are typically undertaken in fintech companies at later stages of their development, when companies might be reluctant to accept financing from an investor who has other investments in competing fintech companies.[18]

C. Common Ownership Networks in Fintech Markets

This section provides an illustration of common ownership connections between rival fintech firms and the interpretation of their associated network graphs. Figure 3 shows the common ownership networks of fintech companies active in the market for payments only in two selected countries, ie, Sweden and the United Kingdom in Figure 3a and Figure 3b respectively. The countries were chosen to contrast payment markets of a different size, with the United Kingdom being the largest European payments market and Sweden a relatively small market.[19] The size of the dark circles in the graphs is a proxy for the firm size in terms of employment and the size of light circles is a proxy for the size of investors in terms of their total dollar fintech investments worldwide. Clearly, the most notable difference between the two markets is the size of the networks. The Swedish market is characterised by just a handful of fintech companies active in payments, each having its own group of investors that is largely unconnected to others. Here, the largest group of investors is backing Klarna (large dark circle at the centre of the graph). Generally, in this market, there is a low overlap of investors across firms.

In contrast, the UK market seems significantly more interconnected, at the first sight. We can observe a large number of companies and investors, with visible links between companies and groups of their investors. More specifically,

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[18] In fact, among investors with the largest number of common holdings in fintech companies, we often observe investors focusing on very early-stage start-ups, ie, incubators, accelerators, angel investors, VC specialising on early-stage investments. Such investors seem to engage in a 'spray and pray' investment strategy by investing small amounts in a large number of early-stage fintech firms. For instance, accelerators Y Combinator in the US and Techstars in the UK have the largest number of fintech holdings (with 165 and 50 investments respectively). At the same time, Y Combinator is ranked only 46th in the US and Techstars is ranked 244th in the UK in terms of their shares of the country's total amount invested in fintech.

[19] We did not choose even smaller markets due to a low number of observations.

the UK market is characterised by the presence of a core group of larger fintech companies (Monzo, Revolut, Wise, Checkout.com, represented by the larger dark circles at the centre of the graph) as well as a few smaller companies (eg, Divido, Currencycloud, GoCardless), each of which is funded by large groups of investors that tend to have at least one other payments company in their portfolio. However, with a closer look, we can observe that beyond the core group of firms and investors shown to be concentrated in the centre, there are many payments companies with investors that tend not to have other investments in the industry. Importantly, there are few investors that hold more than two competitors in their portfolio simultaneously. Specifically, 79 per cent of all investors in the UK payments market have only one such portfolio company; 11 per cent of investors hold two payments fintech companies; and only the remaining 10 per cent have more than two payments companies in their portfolio at the same time, while only four investors hold 10 or more payments companies in their portfolios.

Thus, although more common ownership may seem to exist in the United Kingdom given that Figure 3b shows more connections between payments fintech companies, this does not necessarily mean that the network is denser. Indeed, as we show later when estimating the likely impact of common ownership (lambdas), the UK's payments market is characterised by a lower measure of common ownership. For this reason, one should be careful with interpreting or drawing inferences from network graphs alone, since visually it may be difficult to understand the extent of the likely concerns associated with common ownership.

Figure 3 Network graphs (payments market only)

a. Sweden   b. UK
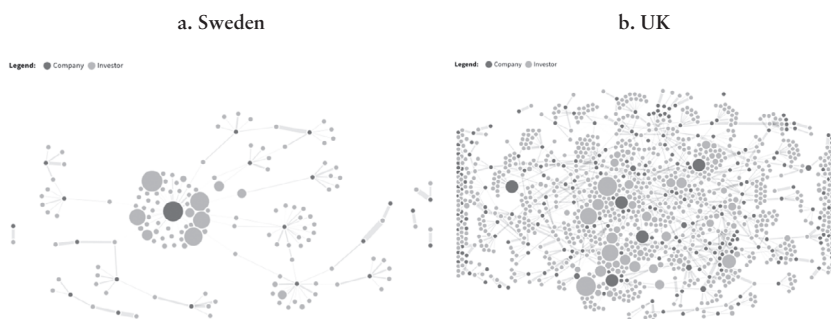
III. IMPACT OF COMMON OWNERSHIP IN FINTECH MARKETS

The above empirical analysis clearly shows that the span of common ownership varies widely across different geographies, fintech markets and investor types. But what is the likely impact of common ownership? Economic theory suggests that common ownership may have both negative and positive effects on

market competition and innovation, depending on the circumstances.[20] A critical component in the competition analysis is estimating the 'common owners' weights' (or 'lambdas'), which serve to assess the magnitude of the likely effects of common ownership based on a unilateral effects analysis. In addition, it is important to consider the parallel existence and interplay of cross-ownership and common ownership structures when evaluating competition effects. This may occur in the context of mergers and acquisitions of fintech companies by investors that may have common shareholdings across other firms in the target's market and/or may themselves be in a competitive relationship with the acquired target company. The following sections expand on these considerations.

A. Theories of Harm and Efficiencies

Common ownership among horizontal competitors, or 'horizontal shareholding',[21] may have adverse effects on competition in the form of increased prices and/or reduced quantities, choice, quality or innovation, as seen in unilateral and coordinated effect theories of harm.[22]

i. Unilateral Effects

Unilateral effects arising from horizontal common ownership have been the focus of most economic research to date. It has been shown that common ownership may lead to lessened incentives to compete,[23] innovate[24] or enter[25] product markets, by means of various mechanisms.[26] The basic assumption that drives these results is that 'under common ownership in oligopoly, "atomistic"

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[20] López and Vives (n 10); X Vives, 'Common Ownership, Market Power, and Innovation' (2020) 70 *International Journal of Industrial Organization* 102528; AJ Gibbon and JP Schain, 'Rising Markups, Common Ownership, and Technological Capacities' (2022) *International Journal of Industrial Organization*, available at: doi.org/10.1016/j.ijindorg.2022.102900.

[21] E Elhauge, 'Horizontal Shareholding' (2016) 129 *Harvard Law Review* 1267.

[22] OECD, 'Common Ownership by Institutional Investors' (n 1) 16–21 (summarising the main theories on the effects of common ownership and early criticisms).

[23] Azar, Schmalz and Tecu, 'Anticompetitive Effects of Common Ownership' (n 2); Azar, Raina and Schmalz (n 2).

[24] On unilateral effects based on reduced innovation incentives, see the European Commission's merger control enforcement practice in Case M.7932 *Dow/DuPont*, Commission decision of 27 March 2017, Annex 5, paras 56–60; and Case M.8084 *Bayer/Monsanto*, Commission decision of 21 March 2018.

[25] Xie (n 2); M Newham, J Seldeslachts and A Banal-Estanol, 'Common Ownership and Market Entry: Evidence from the Pharmaceutical Industry' (2018) DIW Berlin Discussion Paper 1738; A Ruiz-Pérez, 'Market Structure and Common Ownership' (2019), available at: www.cemfi.es/~ruiz-perez/alexandro_ruiz_perez_JMP_nov2019.pdf.

[26] E Elhauge, 'The Causal Mechanisms of Horizontal Shareholding' (2021) 82 *Ohio State Law Journal* 1; Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6); M Antón et al, 'Common Ownership, Competition, and Top Management Incentives' (2023) 131 *Journal of Political Economy*, available at: doi.org/10.1086/722414.

firms and shareholders cannot be assumed, which in turn leads to theories about an altered objective function of the firm (portfolio value maximization)' and altered unilateral competitive incentives (across-firm internalisation of profits).[27] In essence, if 'a firm is exactly a set of assets under common ownership' (eg, following a merger or majority acquisition),[28] it is questioned whether and to what extent assets under partial common ownership belong to only one or another firm, neither or both,[29] especially when based on minority shareholdings.[30] Yet, a 'blurred firm boundary effect' has been empirically found for example in the presence of common VC investors – a common set of investors in fintech firms.[31] In practice, unilateral effects theories suggest that even without any communication or coordination, commonly held firms may have a reduced tendency to expand output or lower prices in order to gain market shares, since this may come at the expense of industry rivals in which the common owners may have extensive, albeit minority, parallel shareholdings.[32]

The theory underlying the commonly held firms' altered market conduct and increased market power is that common ownership affects the incentives and behaviour of the managers of those firms. That is, managers of commonly held firms are thought to maximise the total portfolio profits of their common shareholders, taking into account their parallel holdings in rival firms in the same industry. In an environment of oligopolistic markets where firms strategically interact, aggressive competition – or targeted governance that improves individual firm performance – imposes negative externalities on the commonly held firms and their common shareholders.[33] Therefore, the latter have an incentive to internalise those externalities and in given circumstances, they may also have the power to influence firm management and implement their preferences.

[27] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6) 178–79. On the origins of the economic theory of partial ownership (of which common ownership is a special case) and its more recent extensions, see DP O'Brien and SC Salop, 'Competitive Effects of Partial Ownership: Financial Interest and Corporate Control' (2000) 67 *Antitrust Law Journal* 559; J Azar, 'Portfolio Diversification, Market Power, and the Theory of the Firm' (2016), available at: papers.ssrn.com/abstract=2811221; J Azar and RM Ribeiro, 'Estimating Oligopoly with Shareholder Voting Models' (2022), available at: papers.ssrn.com/abstract=3988265.

[28] B Holmström and J Roberts, 'The Boundaries of the Firm Revisited' (1998) 12 *Journal of Economic Perspectives* 73, 77 (describing as a black box both the market in transaction costs economics and the firm in neoclassical microeconomic theory, and the advantages of the modern property rights approach pioneered by Grossman and Hart that showcases the costs and benefits of integration independently of the presence of a market).

[29] Schmalz, 'Common-Ownership Concentration and Corporate Conduct' (n 9) 418.

[30] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6) 178 (discussing how legal and economic theory on the boundaries of the firm fail to capture partial common ownership in the form of diffuse, minority shareholdings and the significant implications for antitrust analysis).

[31] L Lindsey, 'Blurring Firm Boundaries: The Role of Venture Capital in Strategic Alliances' (2008) 63 *Journal of Finance* 1137.

[32] Schmalz, 'Common-Ownership Concentration and Corporate Conduct' (n 9) 417.

[33] Antón et al, 'Common Ownership, Competition, and Top Management Incentives' (n 26) 28; M Condon, 'Externalities and the Common Owner' (2020) 95 *Washington Law Review* 1.

The control or influence mechanism over managers is clear in the case of 'active' investors and fund managers (eg, through the exercise of voice, exit or engagement).[34] This is particularly so for 'concentrated' common owners with significant stakes, board seats and a dominant voting position in the governance of at least one of their commonly held firms.[35] The same is true for private commonly held companies, where the control dynamics may be more easily and directly observable in practice. For instance, control in a given company may be specified according to provisions in their charter, bylaws or shareholder agreements that may provide for special control rights and governance structures (eg, class-voting rights or dual-class shares).[36] VC investors that extend significant financing to start-ups might contractually agree for additional and direct control rights (eg, veto, board representation) compared with those automatically granted by law based on their minority shareholder status.[37] Although it may be challenging to generalise on the control dynamics for the universe of private companies, one is usually able to observe the specific control arrangements in place in individual firms. In this sense, one may be also able to observe the relative power and potentially active influence of common investors in private firms in concrete cases.

Still, alternative channels of control may exist based on passive mechanisms: when there are no other dominant shareholders in corporate governance, especially in widely held public companies, even perceived 'passive' common institutional investors may be able to realise their collective interests and relative power in pursuit of portfolio value.[38] Such control is de facto and shared among common owners (and possibly with corporate managers) rather than formal and stand-alone.[39] Principal-agent conflicts that are typical in large public corporations with a dispersed ownership structure are factored into the latest economic models and estimations. However, the likely anticompetitive effects of common

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[34] B Charoenwong, Z Ni and Q Ye, 'Active Mutual Fund Common Owners' Returns and Proxy Voting Behavior' (2022), available at: papers.ssrn.com/abstract=4184584; Schmalz, 'Common-Ownership Concentration and Corporate Conduct' (n 9).

[35] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6).

[36] Gl Rauterberg, 'The Separation of Voting and Control: The Role of Contract in Corporate Governance' (2021) 38 *Yale Journal on Regulation* 1124 (discussing the differences between the three instruments and noting that private companies need not publicly disclose any shareholder agreements).

[37] Some VC investors in start-ups publish their model Term Sheets as a matter of good business practice even if they are not legally required to do so. These contracts are subject to negotiation and may also change over time (eg, when there are multiple investors in later and larger rounds). On the process of negotiating boards in start-ups and contractually separating control from ownership, see E Pollman, 'Startup Governance' (2019) 168 *University of Pennsylvania Law Review* 155, 181–83.

[38] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6); Anna Tzanaki, 'The Passive Mechanisms of Common Ownership' (*ProMarket*, 5 May 2022), available at: www.promarket.org/2022/05/05/passive-mechanisms-common-ownership/.

[39] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6).

ownership persist, though they are observed to be limited in magnitude.[40] This means that managers may not fully internalise the anticompetitive incentives of common owners as theoretical models predict, but only partially, due to the presence of (some) managerial agency costs.[41] As a result, contextual and empirical analysis may be necessary in each individual case, to approximate the actual effects of common ownership in a given setting.

Furthermore, quantification measures of common ownership such as the modified Herfindahl–Hirschman Index (MHHI)[42] or the common owners' weights (lambdas)[43] rely on theoretical scholarship based on unilateral effects. The former estimates the level of additional market concentration and 'effective' market power due to common ownership, whereas the latter estimates the degree of internalisation of rivals' profits relative to own firm profits by the firm manager in its objective function due to common ownership.[44] Ultimately, both methods aim to capture the increased unilateral pricing incentives produced by common shareholdings in rival firms.[45] In addition, both measures incorporate the common investors' financial interests (profit share) and degree of influence (control share) in each competing firm in the same industry, in order to quantify those unilateral anticompetitive incentives.

[40] Azar and Ribeiro (n 27); Backus, Conlon and Sinkinson, 'Common Ownership and Competition in the Ready-to-Eat Cereal Industry' (n 2); Antón et al, 'Common Ownership, Competition, and Top Management Incentives' (n 26).

[41] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6) 223; Azar, 'The Common Ownership Trilemma' (n 3) 286–93.

[42] TF Bresnahan and SC Salop, 'Quantifying the Competitive Effects of Production Joint Ventures' (1986) 4 *International Journal of Industrial Organization* 155; O'Brien and Salop (n 27).

[43] Backus, Conlon and Sinkinson, 'Common Ownership in America' (n 4) (who call this measure 'kappa' instead of lambda); Vives (n 20); Azar and Tzanaki (n 9).

[44] Backus, Conlon and Sinkinson, 'Common Ownership in America' (n 4) 275: 'All of these measures – profit weights, MHHI, and alternatives – agree on the broad trend in Figure 1. However, the profit weights approach, which starts with the objective function of the firm, is the only one that offers a fully general path forward for empirical study of the common ownership hypothesis. We emphasize that while we are the first to construct our measure – the common ownership profit weights – at this level of breadth, neither the innovation nor their use in empirical work is novel here. The theory goes back as far as Rotemberg (1984), is implicit in the MHHI measure of Bresnahan and Salop (1986), has been applied to cross–ownership in O'Brien and Salop (2000), and has seen application in various tests of the common ownership hypothesis (Kennedy et al, 2017; Gramlich and Grundl, 2017; Boller and Morton, 2019)'.

[45] The profit weight approach that we employ in this chapter to measure the impact of common ownership is the one that is increasingly being used in the literature since it is more tractable and reliable as a stand-alone measure. The early empirical papers showing anticompetitive effects of common ownership in the airline and banking industries have been partially criticised for using the MHHI to regress the price effects due to endogeneity concerns (although those papers did use additional tests and alternative specifications to address such concerns). For an overview of the critiques, see DP O'Brien and K Waehrer, 'The Competitive Effects of Common Ownership: We Know Less Than We Think' (2017) 81 *Antitrust Law Journal* 729; TA Lambert and ME Sykuta, 'The Case for Doing Nothing About Institutional Investors' Common Ownership of Small Stakes in Competing Firms' (2018) University of Missouri School of Law Legal Studies Research Paper No 2018-21; MB Fox and MS Patel, 'Common Ownership: Do Managers Really Compete Less?' (2022) 39 *Yale Journal on Regulation* 136; Patel (n 8); and for a reply to those critiques, see J Azar, MC Schmalz and I Tecu, 'The Competitive Effects of Common Ownership: Economic Foundations and Empirical Evidence: Reply', available at: papers.ssrn.com/abstract=3044908.

The degree of control that the common owners have materially affects their ability to impact outcomes in corporate governance and market competition. For instance, if the common owners have no control or influence, common ownership will have zero effects. Firms will act independently in the market, as they will continue to maximise their own individual firm value. Typically, most theoretical and empirical economic literature assumes 'proportionate control' – that is, control weights are assumed to be equal to profit weights. Some models check this basic assumption against alternative control scenarios for robustness and still find anticompetitive effects flowing from common ownership.[46] On the other hand, in the absence of other dominant shareholders and special governance structures and given the often relatively large size, systemic presence and potentially cumulative influence of institutional shareholders, common owners may de facto have disproportionate corporate power and thus may substantially affect market outcomes.[47]

Yet, most of the empirical literature on common ownership using different control assumptions to estimate its competitive effects has focused on publicly listed companies commonly held by large institutional investors. Private firms and start-ups, which are more likely (commonly) owned by other types of investors such as VC, have hardly been subject to empirical scrutiny. Importantly, the governance landscape of private firms may differ dramatically from that of public firms. Besides, the specific governance structures in place may vary among private companies (eg, when rights of control or corporate decision-making are allocated based on and governed by tailored shareholder agreements)[48] or between other types of private companies and start-ups (as a special species of entity that defies the public–private company dichotomy and has particular characteristics such as a focus on innovation and financial backing by VC investors who may have a dual role as shareholders and directors on the board of their financed firms).[49] For these reasons, it is crucial that the analysis focuses on the real-life setting in which common ownership is observed, including the specific ownership and governance structures of the commonly held firms (type, size and distribution of shareholders, legal environment and any special contractual

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[46] Azar, Schmalz and Tecu, 'Anticompetitive Effects of Common Ownership' (n 2); Schmalz, 'Common-Ownership Concentration and Corporate Conduct' (n 9).

[47] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6); Schmalz, 'Common-Ownership Concentration and Corporate Conduct' (n 9).

[48] Shareholder agreements may alter the default allocation of control based on statutory corporate law, eg, shareholder control rights as a function of their voting power. On the prevalence of this contractual technique especially among private (but also public) companies and the implications, see the seminal analysis by Rauterberg (n 36); J Fisch, 'Stealth Governance: Shareholder Agreements and Private Ordering' (2022) 99 *Washington University Law Review* 913.

[49] Fisch (n 48) 915 ('the term startup [is used] to describe the growing category of innovative venture-funded companies that defy the traditional categories of public and private companies'); Pollman (n 37) (offering a new illuminating account of the governance complexity and particularities of start-ups, given the innovative and evolving nature of their business and capital structure, which are characterised by heterogenous shareholders, overlapping governance roles and often board monitoring failures).

arrangements shaping corporate governance) as well as the relevant market structures (concentrated markets with oligopolistic competition, structural and personal links among the commonly held firms).[50]

ii. Coordinated Effects

Common ownership may also affect competition in product markets by means of coordinated effects. Theories of harm relating to coordinated effects suggest that common ownership may increase the likelihood for either explicit coordination among commonly held firms or tacit collusion under conducive market conditions and other surrounding conditions.[51] Either way, the market conduct of the firms changes in a coordinated fashion, as does the industry equilibrium, with the goal of maximising joint profits and gaining monopoly rents. Besides, non-commonly held rival firms in the oligopoly may have aligned interests to achieve a coordinated outcome, as they may share in the supracompetitive profits.[52]

Common shareholders may facilitate explicit or implicit coordination through various means. First, common owners may act as 'cartel ringmasters' or 'instigators' by having an active and leading role in orchestrating anticompetitive coordination among their portfolio firms.[53] This could be achieved through common owners' active discussions and engagement with corporate management or boards, with a view to influence the companies' long-term strategies,[54] during private meetings or during earning calls where investors are present and firm and industry profitability are discussed.[55] As relatively large minority shareholders, common owners may have privileged access to management and more generally they may have more control than their formal equity share suggests.[56] Like an industry association or a non-rival (consulting) firm that could serve as a

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[50] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6); GC Means, 'The Separation of Ownership and Control in American Industry' (1931) 46 *Quarterly Journal of Economics* 68.

[51] EB Rock and DL Rubinfeld, 'Common Ownership and Coordinated Effects' (2020) 83 *Antitrust Law Journal* 201; Patel (n 8) 49; A Tzanaki, 'The Regulation of Minority Shareholdings and Other Structural Links between Competing Undertakings: A Law & Economics Analysis' (PhD thesis, UCL (University College London) 2017); Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6) 206; L Boller and F Scott Morton, 'Testing the Theory of Common Stock Ownership' (2019) NBER Working Paper No w27515.

[52] Rock and Rubinfeld (n 51) 226; Boller and Scott Morton (n 51) 38.

[53] For a comprehensive overview of coordinated effects theories, see Rock and Rubinfeld (n 51) who 'identify five scenarios, based on antitrust case law and enforcement experience, in which common ownership could plausibly increase the potential for coordinated conduct in concentrated markets'. Common owners acting as a 'cartel ringmaster' or initiator is one of these scenarios: eg, the 'frackers hypothetical' the authors analysis has a loose basis on an actual case reported in the business press when large common shareholders met with the aim to get frackers to cut output and boost profits.

[54] Case M.7932 *Dow/DuPont*, Commission decision of 27 March 2017, Annex 5, para 19.

[55] Rock and Rubinfeld (n 51).

[56] Case M.7932 *Dow/DuPont*, Commission decision of 27 March 2017, Annex 5, §3 and 4; Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6).

'cartel facilitator', common owners may promote explicit agreement or information-sharing regarding important competitive parameters among industry rivals and thus actively and in full knowledge contribute to the implementation and maintenance of a cartel.[57] Indeed, there is some evidence that rival firms with common ownership links may explicitly conclude anticompetitive agreements to raise prices (and profits), restrain output[58] and prevent or delay entry (eg, settlement agreements between commonly held brand and generic drug manufacturers that aim to withhold generic entry into pharmaceutical markets).[59]

Furthermore, common owners may serve as a conduit of communication or a channel for access to and transmission of information among the commonly held firms.[60] Information exchanges, especially private ones, 'can help to provide focal points and more generally solve the coordination problem that arises in a prisoner's dilemma setting',[61] but also fill in the gaps in a real-world 'incomplete cartel contract' that is legally unenforceable, by ensuring monitoring and compliance among the cartelising firms (and avoiding misinterpreting rival moves as deviations due to a changing environment).[62] In this way, common ownership links may help align incentives among the commonly held firms and thus enhance the transparency and credibility of communications regarding their competitive strategies.[63] Even public statements or unilateral disclosures expressing the common shareholders' strategic preferences regarding the future conduct of their portfolio firms in the market may under certain circumstances potentially be considered anticompetitive.[64] Besides, common ownership is shown to increase voluntary disclosure of strategic information that promotes coordination between firms.[65]

Common owners may also encourage adoption of executive compensation packages tied to rival or industry performance and designed to align incentives

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[57] Cartel facilitators are sanctioned under EU competition law as long as they qualify as 'undertakings' even if they are not active in the same market(s) where the cartel takes place. A Vallery and C Schell, 'AC-Treuhand: Substantial Fines for Facilitators of Cartels' (2016) 7 *Journal of European Competition Law & Practice* 254.

[58] Bradley Olson and Lynn Cook, 'Wall Street Tells Frackers to Stop Counting Barrels, Start Making Profits' *Wall Street Journal* (13 December 2017), available at: www.wsj.com/articles/wall-streets-fracking-frenzy-runs-dry-as-profits-fail-to-materialize-1512577420.

[59] J Xie and J Gerakos, 'Institutional Cross-Holdings and Generic Entry in the Pharmaceutical Industry' (2020) 110 *AEA Papers and Proceedings* 569.

[60] Rock and Rubinfeld (n 51); Patel (n 8) 52.

[61] Rock and Rubinfeld (n 51) 234.

[62] M Motta, 'Review of Michael Whinston, Lectures on Antitrust Economics (MIT Press, 2006)' (2007) 3 *Competition Policy International* 316.

[63] EU Horizontal Merger Guidelines, recitals 47–48; Rock and Rubinfeld (n 51).

[64] ibid; OECD, 'Unilateral Disclosure of Information with Anticompetitive Effects' (2012) Policy Roundtable DAF/COMP(2012) 17; I Lianos and F Wagner-von Papp, 'Tackling Invitations to Collude and Unilateral Disclosure: The Moving Frontiers of Competition Law?' (2022) 13 *Journal of European Competition Law & Practice* 249.

[65] A Pawliczek, AN Skinner and SLC Zechman, 'Facilitating Tacit Collusion through Voluntary Disclosure: Evidence from Common Ownership' (2022), available at: papers.ssrn.com/abstract=3382324.

between common owners and managers of their portfolio firms.[66] Inducing agreement on common facilitating practices such as incentive schemes is another means of facilitating coordination.[67] Indeed, common ownership as cross-ownership may in itself be an anticompetitive facilitating practice.[68] It has been also claimed that common ownership may be a substitute for explicit collusion in certain industries.[69]

Even without any explicit agreement or communication, common owner-ship may be able to induce and sustain tacit collusion by altering the incentives of portfolio and rival firms to collude or compete, and their relative gains and losses.[70] However, economic research on market-wide tacit collusion in the abstract is inconclusive. On the one hand, common owners may increase the like-lihood and success of collusion by increasing firms' incentives to collude and the discount rate for managers of their portfolio firms.[71] This, in turn, increases their long-term gains from cooperation and decreases the incentives and likelihood of defection. On the other hand, common ownership may render punishment softer and less costly for deviating firms. This is because, when competition reverts to the pre-existing non-collusive level at the punishment stage, firms may earn higher profits if common ownership generates unilateral effects.[72] This increases the incentive to deviate and makes collusion harder to sustain.

In short, common ownership may have a coordinating, signalling or moni-toring and deterring function, enabling coordinated market outcomes. These effects and functions of common shareholders among competitors, and related antitrust risk, may be exacerbated if common ownership (structural links) is coupled with interlocking directorates (personal links).[73] In such case, common investors may be able to appoint the same person(s) as a director on the board of

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[66] Rock and Rubinfeld (n 51); W Neus, M Stadler and M Unsorg, 'Market Structure, Common Ownership and Coordinated Manager Compensation' (2020) University of Tübingen Work-ing Papers in Business and Economics No 133; W Neus and M Stadler, 'Common Holdings and Strategic Manager Compensation: The Case of an Asymmetric Triopoly' (2020) 39 *Managerial and Decision Economics* 814.

[67] SC Salop, 'Practices That (Credibly) Facilitate Oligopoly Coordination' in JE Stiglitz and GF Mathewson (eds), *New Developments in the Analysis of Market Structure* (MIT Press, 1986).

[68] Tzanaki, 'The Regulation of Minority Shareholdings and Other Structural Links between Competing Undertakings' (n 51); D Gilo, 'Partial Ownership as a Strategic Variable to Facilitate Tacit Collusion' (1995) 10/95, revised 4/97 John M Olin Program in Law, Economics, and Business, Harvard Law School, Discussion Paper No 170.

[69] Banal-Estañol, Newham and Seldeslachts (n 2) 98.

[70] Rock and Rubinfeld (n 51); Patel (n 8).

[71] Boller and Scott Morton (n 51) 38.

[72] Patel (n 8) 52–53. Yet the collusion analysis and the underlying economic incentives are complex as Patel notes. For economic models showing under what conditions partial ownership may hinder or facilitate collusion, see respectively DA Malueg, 'Collusive Behavior and Partial Ownership of Rivals' (1992) 10 *International Journal of Industrial Organization* 27; D Gilo, Y Moshe and Y Spiegel, 'Partial Cross Ownership and Tacit Collusion' (2006) 37 *Rand Journal of Economics* 81.

[73] Y Nili, 'Horizontal Directors' (2020) 114 *Northwestern University Law Review* 1179; J Azar, 'Common Shareholders and Interlocking Directors: The Relation Between Two Corporate Networks' (2022) 18 *Journal of Competition Law & Economics* 75; Eldar, Grennan and Waldock (n 8); OECD, 'Antitrust Issues Involving Minority Shareholdings and Interlocking Directorates' (2009) Policy Roundtable DAF/COMP(2008) 30.

multiple competing firms in which they have common shareholdings. Similarly, if common owners are also common creditors in rival firms, the likelihood of collusion is increased.[74]

iii. *Efficiencies and Procompetitive Effects*

Common ownership of horizontal competitors may also generate procompetitive efficiencies and other beneficial effects for consumers and society.[75] Efficiencies that enhance the commonly held firms' abilities and incentives to compete or innovate, for instance by realising cost savings or innovation synergies, may outweigh any negative effects on competition and benefit consumers, leading to lower prices, higher quality, new or improved products and services and/or more choice.[76] These are favourably viewed by antitrust enforcers and policymakers. While common ownership may produce additional and substantial benefits for corporate governance and the operation of capital markets (eg, minimising managerial agency costs, greater diversification, lower cost of capital, increased liquidity) that result in profit for shareholders and investors, consumers do not generally stand to gain.[77] Competition policy does not trade off such efficiencies against competition and consumer harms. These are disregarded by antitrust enforcers as 'out-of-market' efficiencies,[78] since competition enforcement is in principle 'market-specific'.[79]

An important parameter of competition in fintech markets, which are generally more dynamic in nature, is innovation. Several theoretical and empirical economic studies indicate that common ownership in both publicly traded and private firms (start-ups) may have positive effects on innovation under specific circumstances. These effects are particularly pronounced in high-tech or highly innovative industries that are subject to large innovation and technological and informational spillovers.[80] Indeed, it has been shown that common ownership

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[74] DD Sokol, 'Debt, Control, and Collusion' (2022) 71 *Emory Law Journal* 695.

[75] OECD, 'Common Ownership by Institutional Investors' (n 1) 28–29 (summarising the literature on potential benefits from common ownership).

[76] Azar and Tzanaki (n 9) 275.

[77] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6) 170, 204, 217; OECD, 'Common Ownership by Institutional Investors' (n 1) 28–29; JB Baker, 'Overlapping Financial Investor Ownership, Market Power, and Antitrust Enforcement: My Qualified Agreement with Professor Elhauge' (2016) 129 *Harvard Law Review Forum* 212, 227–31 (noting, however, that within-industry diversification benefits to financial investors holding shares in competitors are limited because industry profits and equity values are highly positively correlated; besides, if common ownership lessens competition this increases the positive correlation and further lessens the diversification benefits).

[78] Azar and Tzanaki (n 9) 276; Patel (n 8) 56.

[79] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6) 204 ('competition enforcement is "market-specific" in that only efficiency gains within the same relevant market [and for the same group of consumers] may offset potential anticompetitive unilateral effects [consumer harm] found in that market').

[80] López and Vives (n 10); Antón et al, 'Innovation' (n 10); Eldar, Grennan and Waldock (n 8); J González-Uribe, 'Exchanges of Innovation Resources inside Venture Capital Portfolios' (2020) 135 *Journal of Financial Economics* 144; Gibbon and Schain (n 20).

by VC investors is blurring firm boundaries, solving incomplete contracting and information problems, a (welfare increasing) effect that is particularly important to the success of young firms.[81] However, depending on the specific type of common investors (eg, large asset managers and institutional investors or venture capitalists, focused or long-term financial investors), the magnitude of efficiencies and the means through which these are attained may differ.[82] Accordingly, the innovation implications of common ownership may differ depending on the specificities of the particular industries, firms and investors.[83] For these reasons, the analysis of the innovation effects of common ownership needs to be case-specific, like the analysis of the competition effects.

The rationale for bringing about these welfare-enhancing effects is of the same logic as that underlying unilateral and coordinated theories of harm: (i) common owners are interested in maximising their total portfolio profits and in doing so, they will induce corporate managers to internalise *positive* externalities among their portfolio firms;[84] or (ii) common owners may have the incentives and abilities to induce *beneficial* coordination and facilitate information flows among their portfolio firms.[85] In the case of VC investors, 'active' mechanisms due to strong control rights and board representation across commonly held rival firms may provide a more straightforward and observable means of effectuating such effects.[86] Furthermore, it is suggested that common ownership in private markets may counterbalance any short-term anticompetitive effects of common ownership among public firms, as the former may encourage entrepreneurial activity and entry of innovative, high-growth start-ups into dormant industries and thus disrupt larger firms that may be commonly owned and have limited incentives to compete.[87]

More generally, common ownership may mitigate firms' disincentives to innovate and invest in cost-reducing research and development (R&D) by solving the technological spillover problem among portfolio firms.[88] Moreover, common institutional ownership may improve innovation productivity as well as rationalise and minimise wasteful duplicative efforts.[89] Common institutional owners may also increase innovation incentives by attenuating the career risks of corporate managers.[90] Besides, they may be able to play a more active monitoring role

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[81] Lindsey (n 31).

[82] P Borochin, J Yang and R Zhang, 'The Effect of Institutional Ownership Types on Innovation and Competition' (2018) Working Paper, available at: papers.ssrn.com/abstract=3204767.

[83] López and Vives (n 10); Eldar, Grennan and Waldock (n 8).

[84] López and Vives (n 10); Vives (n 20).

[85] J He and J Huang, 'Product Market Competition in a World of Cross-Ownership: Evidence from Institutional Blockholdings' (2017) 30 *Review of Financial Studies* 2674.

[86] O Eldar and J Grennan, 'Common Ownership and Entrepreneurship' (2021) Duke Law School Public Law & Legal Theory Series No 2021-25 3.

[87] ibid.

[88] López and Vives (n 10).

[89] He and Huang (n 85).

[90] P Aghion, J Van Reenen and L Zingales, 'Innovation and Institutional Ownership' (2013) 103 *American Economic Review* 277.

and act as a market-based mechanism to internalise governance externalities among the commonly held firms.[91] In addition, common investors may have a knowledge-sharing role that enables them to transfer knowhow from one firm to benefit another.[92] As such, common institutional investors, even passive ones, are found to help facilitate the diffusion of information about new technologies between commonly held firms, leading to innovation.[93]

Similar beneficial effects are for the most part evidenced when start-ups share a common VC investor. Common VC ownership reduces duplication of R&D costs (which can help solve a market failure in patent races, for example), it leads venture capitalists to shut down lagging product development projects, withhold funding from lagging start-ups and redirect those start-ups' innovation. All this leads to improved innovation efficiency.[94] Besides, common venture capitalists and VC directors serving on other start-up boards are shown to facilitate and spur start-up growth for a number of reasons.[95] Commonly held start-ups benefit through raising more capital through more investment rounds, or through the sharing of valuable information and the efficient allocation of opportunities among start-ups thanks to accumulated expertise.[96] In addition, they are less likely to fail, and exit more successfully through an IPO or acquisition by another commonly held start-up.[97]

As a result, the procompetitive effects of common ownership, especially in fintech markets and in VC-financed start-ups that are innovation-driven and potentially subject to significant benefits from VC advising, should be taken into account by competition agencies and weighed against any anticompetitive effects.[98]

B. Common Ownership Weights

In this section, we provide an empirical estimation of the likely impact of common ownership in fintech markets in light of its observed levels in different countries and product markets. First, we explain the theory and assumptions underlying the estimation process and present the formula for the calculation of the common owners' weights or lambdas.[99] Next, we provide empirical evidence

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[91] J He, J Huang and S Zhao, 'Internalizing Governance Externalities: The Role of Institutional Cross-Ownership' (2019) 134 *Journal of Financial Economics* 400.

[92] K Gao et al, 'The Power of Sharing: Evidence from Institutional Investor Cross-Ownership and Corporate Innovation' (2019) 63 *International Review of Economics & Finance* 284.

[93] L Kostovetsky and A Manconi, 'Common Institutional Ownership and Diffusion of Innovation' (2020) Working Paper, available at: papers.ssrn.com/abstract=2896372.

[94] X Li, T Liu and LA Taylor, 'Common Ownership and Innovation Efficiency' (2021) Jacobs Levy Equity Management Center for Quantitative Financial Research Paper.

[95] Eldar, Grennan and Waldock (n 8); Eldar and Grennan (n 86).

[96] Eldar, Grennan and Waldock (n 8).

[97] ibid.

[98] Schmalz, 'Recent Studies on Common Ownership' (n 8) 22.

[99] See above (n 43).

on country-level common ownership lambdas in the largest fintech markets, both overall and broken down by narrower product market segments.

Starting with the estimation process employed, we estimate investors' ownership share in a given company based on our company-funding round-investors dataset described in section II.A. Our main measure of an investor's ownership share is a weighted average of their investment shares across all financing rounds:

$$Ownership\ Share_{i,j} = \sum_{n=1}^{N} w_{j,n} \frac{Investment_{i,j,n}}{Total\ Investment_{j,n}}$$

Here, *Ownership Share*$_{i,j}$ is the estimated ownership percentage of investor *i* in company *j*; *Investment*$_{i,j,n}$ is the amount that investor *i* contributed in round *n* raised by company *j*; *Total Investment*$_{i,j,n}$ is the total capital company *j* raised in round *n* from all participating investors; *N* is the total number of rounds raised by company *j*. Weights $w_{j,n}$ are the company's average equity percentage sold in round *n*, adjusted for its dilution in future rounds due to issuing of new shares when new rounds of financing are raised.

Estimation of ownership shares in fintech companies is not straightforward because the companies in our sample were privately owned and thus not obliged to disclose all details of their financing process. This prompted us to make several assumptions in the estimation of the ownership shares.[100] In our data, the exact amount of capital contributed by a specific investor in each round, *Investment*$_{i,j,n}$, was not always known. Databases on VC financing often report information on the total size of a financing round, *Total Investment*$_{j,n}$, but not on how much each investor contributed to that round. Therefore, our estimations were based on the assumption that *all investors contributed equal dollar amounts within the same investment round (Assumption 1)*. Second, our data did not allow us to observe how much of its equity the company sold in each round. Therefore, we approximated the equity shares sold in each round, $w_{j,n}$, based on VC industry benchmarks: we assumed that *the company issued and sold 10 per cent of its equity in a pre-seed round, 25 per cent in the seed and in the Series A rounds, 20 per cent in Series B and C, and 15 per cent in each of the remaining rounds (Assumption 2)*. In this, we accounted for the fact

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[100] We pursue this empirical approach because of limitations in the financing and ownership data we have access to: eg, we are not able to observe (i) whether governance of private firms is tailored ad hoc based on shareholder agreements that provide for special governance structures or atypical allocation of control rights; or (ii) whether investors indicate that they are active or passive shareholders, in order to factor in those parameters in our empirical analysis regarding the level of influence common shareholders may possess vis-a-vis other corporate actors. While there are techniques in the economic literature to override these data limitations (eg, by using proxies), these would be imperfect and largely based on additional assumptions rather than observation. With our approach, by contrast, we aim to systematically approximate the level of activism by reference to ownership share, which we estimate using two different methods described in this section. Besides, our methodology employing lower and upper bounds (and in-between control scenarios) for the 'lambda' calculations aims to capture the potential range of effects of common ownership, given the data limitations we are faced with within the universe of private companies, including start-ups.

that each following investment round dilutes previous investors' ownership. In practice, equity shares sold in each round may vary depending on the required investment amount, bargaining power of participating investors and implied company valuation. However, our conclusions are not sensitive to decreasing or increasing all or some of the used approximate equity shares by several percentage points as the estimated measures of common ownership concentration change only marginally as a result of such modifications. This is because the impact of the actual shares on the lambda calculation is less significant than there being a common owner or not. We further assumed that *all unsold equity belonged to the founder, who did not have significant holdings in other fintech firms (Assumption 3)*. To check the sensitivity of our results to using different methods of ownership estimation, we also measured the *Ownership Share* as a percentage of an investor's dollar investment in the firm relative to the total capital raised by the firm. This method may underestimate the importance of early investors and overestimate the ownership share of late investors since the latter usually contribute substantially larger amounts. Nevertheless, even when this method of estimating ownership shares was used, the results did not change significantly (not tabulated).

The formula used to calculate the weight that firm j puts on the profits of firm k due to common ownership, the lambda, is as follows:

$$\lambda_{jk} = \frac{\sum_{i \in I} \gamma_{ij} \beta_{ik}}{\sum_{i \in I} \gamma_{ij} \beta_{ij}},$$

where γ_{ij} is the control share of shareholder i in firm j, β_{ij} is the ownership share of shareholder i in firm j, and I denotes the set of shareholders in firm j. This formula applies whenever the objective function of the firm is to maximise a weighted average of shareholder profits, with the control shares γ_{ij} as weights. This objective function was used by O'Brien and Salop (2000) and can be microfounded as the equilibrium outcome of a model of shareholder voting as shown in Azar (2012).[101] Firm j's objective is then to maximise:

$$\sum_{i \in I} \gamma_{ij} \sum_{k=1}^{J} \beta_{ik} \pi_k.$$

As shown in Azar (2012),[102] this is equivalent to maximising:

$$\pi_j + \sum_{k \neq j} \lambda_{jk} \pi_k,$$

where λ_{jk} has the formula above.

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[101] O'Brien and Salop (n 27); J Azar, 'A New Look at Oligopoly: Implicit Collusion Through Portfolio Diversification' (PhD dissertation, Princeton University 2012).

[102] Azar, 'A New Look at Oligopoly' (n 101) ch 7.

Based on this formula for the estimation of firm-level lambdas, we estimated average lambdas at the country level, as a simple average and as a weighted average, where we used each fintech company's sales estimate provided by Crunchbase as weights. Table 5 shows the estimated country-level common ownership lambdas in the largest fintech markets. Only countries with at least 30 fintech firms with available ownership data are included in the table.

Table 5 shows lambda estimates for two scenarios: (i) a baseline scenario using the assumptions described above ('lower-limit estimates') where a single founder holds the remaining equity of the company and possibly its sole control (when the company's equity not sold to investors exceeds 50 per cent); and (ii) an alternative scenario outlined below that is used as a robustness check for comparison ('upper-limit estimates') where external investors jointly have full control of the company (on a proportionate basis to their shares). In our baseline lambda estimations, we assumed that the founder controls the remaining equity not sold to the investors. In our sample, a fintech company was estimated to sell 33 per cent of equity, on average, to external investors (older companies with more financing rounds sell more and younger companies with fewer financing rounds sell less). Thus, the company's founder was assumed to control the remaining 67 per cent, on average. Note that company founders were assumed not to have holdings in other fintech companies as we could not observe their actual shareholdings in other private firms. Considering these assumptions, lambdas estimated with this method can be interpreted as a likely lower bound of the actual lambdas. Therefore, to make sure we do not underestimate the actual effects of common ownership in fintech markets, we proceeded to estimate an upper bound for the countries' lambdas. We assumed that equity not issued to investors recorded in the database was dispersed and none of the unrecorded owners (eg, founders and employees that typically hold shares in the start-up) had significant control. Hence, we assumed that the investors held all the control over the company, proportionally to their estimated ownership shares. This assumption allowed us to estimate a likely upper limit for lambdas. When comparing the resulting upper against the lower limits for lambdas, one may conclude that in both cases the observed common ownership overlaps may produce some effects, although the likely effects are relatively larger in the alternative, upper-limit, scenario compared to the baseline, lower-limit, scenario.

Nevertheless, the estimated lambdas under either of these scenarios are still significantly smaller than those found in public markets. This is in large part due to the fact that in public markets, there is a set of large shareholders (including the Big Three and others) that owns large blocks of shares in essentially all firms. When the same shareholder owns shares in a given number N of firms, the number of common ownership connections between the firms

that this creates is N(N − 1), counting firm pairs in the two possible orders. For example, suppose a shareholder owns – for simplicity – 100 per cent of 10 firms out of a set of 500 firms in total. The lambdas for the pairs between those 10 firms are all equal to one. However, there are only $10 \times 9 = 90$ firm pairs with lambdas equal to one, out of a total of $500 \times 499 = 249,500$ firm pairs. The lambdas for the remaining 249,410 firm pairs are all equal to zero. Thus, even though there are 90 common ownership connections between the firms, the large proportion of zero lambdas implies that the average lambda is approximately zero. Compare this to a scenario in which a shareholder owns all 500 firms, creating 249,500 common ownership connections instead of 90, and yielding an average lambda of one. The latter situation approximates the common ownership pattern among large publicly traded firms (except with a common ownership connection intensity as measured by the lambda of about 0.7 instead of 1), while the former situation approximates the pattern we observe among privately held firms.

We also considered a scenario in which there is not only one, but several founders (all founders of a fintech company listed in the Crunchbase database), holding equal proportions of the equity not sold to external investors. This scenario assumed the existence of multiple founders sharing the remaining equity of the company (and possibly its control if their cumulative shareholdings exceed 50 per cent of the company's equity) in addition to several external, and potentially common, investors. Under this assumption, we obtained lambda estimates that were slightly higher than in the baseline lower-limit scenario, but significantly lower than in the upper-limit scenario. We have not separately tabulated these results, but they served as an intermediate scenario of ownership and control allocation that fit the suggested range of estimated lambdas, lower and upper limits, shown below.[103]

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[103] The literature further suggests that 'control sharing' between founders and investors, albeit ad hoc, may be common in start-ups and VC backed private firms. Yet, shareholder agreements that provide for special control sharing arrangements need not be disclosed by private companies. Such arrangements are typically designed to favour minority shareholders, for instance by designating them representation on the company's board directly by contract rather than based on voting power depending on the level of their shareholding. Against this backdrop, our intermediate control scenarios could be enriched to account for such 'control sharing' arrangements where control is shared between the founders and the different external (common and non-common) investors of the company. On the above and for the definition of 'control sharing', see Rauterberg (n 36) 1144. In this shared control scenario, we expect that the lambdas estimations could surpass our upper-limit estimates only if control is not proportionate but asymmetric in favour of common investors vis-a-vis founders and other non-common shareholders. For other 'control sharing' cases (eg, disproportionate control not by common investors), the transition from 'founder' to 'shared with investors' control is not expected to generate lambdas above the upper limit of our results. In future work, one could also collect data on corporate board members to investigate and systematically analyse the ad hoc control dynamics in private companies by alternative means and compare empirical results obtained on 'lambda' estimations with those presented here using our methodology.

Table 5 Lambdas by country

		Lower-limit estimates		Upper-limit estimates	
Country	N companies	Simple average	Weighted by revenue	Simple average	Weighted by revenue
Europe					
UK	765	0.0007	0.0008	0.0089	0.0055
Germany	194	0.0014	0.0025	0.0103	0.0067
France	136	0.0015	0.0022	0.0114	0.0087
Spain	112	0.0010	0.0012	0.0164	0.0219
Switzerland	90	0.0003	0.0002	0.0050	0.0042
Sweden	63	0.0032	0.0039	0.0199	0.0113
Italy	53	0.0014	0.0012	0.0198	0.0149
The Netherlands	52	0.0022	0.0009	0.0155	0.0039
Ireland	46	0.0125	0.0172	0.1477	0.0815
Estonia	40	0.0008	0.0004	0.0473	0.0103
Denmark	31	0.0089	0.0234	0.0819	0.0842
Americas					
US	2,375	0.0005	0.0015	0.0054	0.0045
Canada	215	0.0005	0.0010	0.0102	0.0096
Brazil	191	0.0016	0.0035	0.0179	0.0216
Mexico	108	0.0025	0.0048	0.0305	0.0231
Colombia	48	0.0009	0.0002	0.0123	0.0007
Chile	38	0.0040	0.0021	0.0504	0.0162
Argentina	37	0.0018	0.0014	0.0206	0.0108
Asia					
China	400	0.0005	0.0009	0.0043	0.0035
India	380	0.0009	0.0055	0.0081	0.0102
Singapore	209	0.0006	0.0010	0.0067	0.0093
Indonesia	69	0.0038	0.0029	0.0333	0.0149
Japan	50	0.0061	0.0122	0.0305	0.0243
South Korea	42	0.0032	0.0127	0.0160	0.0224
Australia	119	0.0009	0.0005	0.0071	0.0152
Middle East					
Israel	92	0.0012	0.0010	0.0201	0.0072
United Arab Emirates	52	0.0006	0.0008	0.0100	0.0214
Turkey	35	0.0015	0.0013	0.0217	0.0112

Table 5 *(Continued)*

		Lower-limit estimates		Upper-limit estimates	
Country	N companies	Simple average	Weighted by revenue	Simple average	Weighted by revenue
Africa					
South Africa	56	0.0006	0.0004	0.0049	0.0020
Nigeria	53	0.0014	0.0010	0.0286	0.0139
Kenya	34	0.0004	0.0013	0.0086	0.0075

As can be seen in Table 5, the highest lambdas under our baseline scenario are observed in the countries with the highest levels of combined shareholdings by top investors as reported in section II (eg Ireland, Denmark, South Korea). That is, the markets that have the highest top-10 investors' combined investment share and that are typically smaller in size in terms of the number of fintech firms in our sample. However, when measured against the benchmark common ownership weights in publicly traded firms estimated at the level of 0.72 in 2017, these country-level lambdas are generally relatively small.[104] This suggests that the average effect of common ownership in private markets across countries is rather limited or negligible by comparison to the effect in public markets.

Comparison of the different lambdas' estimations shown in Table 5 reveals that the magnitude of lambdas in the scenario representing the upper limit of the lambda estimates is found to be from two to about 10 times higher than in the baseline scenario. Nonetheless, the lambdas are still low compared with average lambdas observed in public markets. The highest weighted average lambda estimates, at 0.08, are again in Ireland and Denmark. Meanwhile, even under this scenario, the United Kingdom has a lambda of 0.006, the US 0.005 and Sweden 0.011. Therefore, we can safely conclude that even if we assume that fintech companies' founders do not hold control, which is instead proportionally distributed among investors, most of the analysed markets have low common ownership lambdas. We also benchmark our fintech lambda estimates with lambdas calculated for private companies in the biotechnology market in the US.[105] We estimate an upper-limit, simple average biotech lambda using the same method as described above and obtain the estimate of 0.01. Compared with this value, fintech lambdas are lower (0.0054 for the same type of lambda), suggesting that the likely impact of common ownership is lower compared with a similarly innovative market such as biotech.

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[104] Azar and Vives, 'General Equilibrium Oligopoly and Ownership Structure' (n 10).

[105] Because our data from Crunchbase is limited to fintech companies and their financing, the estimate of benchmark lambda for the biotechnology market is based on another popular VC and PE investments database, Refinitiv.

Table 6 shows the estimated country-level common ownership lambdas by specific fintech market segment in the selected countries under the baseline scenario. These lambdas are weighted averages, with the weights being company sales. Lambdas are estimated only for product markets with at least 10 fintech companies.

Table 6 Lambdas by product market and country – lower-limit estimates

Country	Overall country lambda	Product market				
		Loans	Payments	Asset management	Insurance	Blockchain
Europe						
UK	0.0008	0.0013	0.0014	0.0002	0.0020	0.0004
Germany	0.0025	0.0029	0.0037	0.0006	0.0011	0.0008
France	0.0022	0.0053	0.0033	0.0015	0.0041	0.0004
Spain	0.0012	0.0012	0.0009	0.0016	0.0025	0.0001
Switzerland	0.0002	0.0001	0.0001	0.0001	–	0.0001
Sweden	0.0039	0.0067	0.0059	0.0073	–	–
Italy	0.0012	0.0007	0.0013	0.0046	0.0001	–
The Netherlands	0.0009	0.0003	0.0007	–	–	–
Ireland	0.0172	0.0388	0.0328	–	–	–
Estonia	0.0004	0.0008	0.0005	–	–	0.0005
Denmark	0.0234	–	0.0116	–	–	–
Americas						
US	0.0015	0.0009	0.0016	0.0023	0.0009	0.0028
Canada	0.0010	0.0019	0.0014	0.0003	0.0001	0.0003
Brazil	0.0035	0.0095	0.0101	0.0102	0.0013	0.0002
Mexico	0.0048	0.0077	0.0078	0.0049	0.0002	–
Colombia	0.0002	0.0000	0.0002	–	–	–
Chile	0.0021	–	0.0026	0.0030	–	–
Argentina	0.0014	0.0013	0.0000	–	–	–
Asia						
China	0.0009	0.0018	0.0016	0.0021	0.0013	0.0002
India	0.0055	0.0064	0.0030	0.0028	0.0004	0.0012
Singapore	0.0010	0.0028	0.0007	0.0044	0.0013	0.0006
Indonesia	0.0029	0.0016	0.0024	0.0015	–	–

Table 6 *(Continued)*

Country	Overall country lambda	Product market				
		Loans	Payments	Asset management	Insurance	Blockchain
Japan	0.0122	0.0110	0.0136	0.0151	–	0.0041
South Korea	0.0127	0.0837	0.0476	0.0025	–	0.0211
Australia	0.0005	0.0006	0.0015	0.0023	–	0.0020
Middle East						
Israel	0.0010	0.0019	0.0013	0.0005	0.0119	0.0003
United Arab Emirates	0.0008	0.0006	0.0008	0.0019	–	–
Turkey	0.0013	0.0038	0.0019	–	–	–
Africa						
South Africa	0.0004	0.0000	0.0003	–	0.0001	–
Nigeria	0.0010	0.0007	0.0013	–	–	–
Kenya	0.0013	0.0003	0.0002	–	–	–

Table 6 confirms the findings and conclusions drawn from Table 5. Here too, when fintech markets are looked at more narrowly by specific product market segment, the estimated lambdas are generally small in absolute terms. A notable exception where higher lambdas, relatively speaking, are observed in specific fintech markets are in loans and payments in Ireland and South Korea, for example. Still, when compared with similar common ownership weights in public firms, the numbers are very small. Thus, also at the narrower product market level, the estimated likely effects of common ownership in fintech start-ups and private firms are rather small.

Table 7 follows the same structure as Table 6 but shows upper-limit estimates instead of lower-limit estimates. This again shows that the assumption of a lack of control by company founders results in significantly higher estimates than in the baseline scenario. However, the majority of country-product markets illustrated in Table 7 still have low common ownership lambdas. As previously, the exceptions are Ireland, Denmark and South Korea, which have higher common ownership lambdas in the loans and payments markets. Further, somewhat higher common ownership lambdas can also be observed in the following markets: (i) in the asset management fintech markets in Spain, Sweden, Italy and Japan; (ii) in the insurtech market in Israel; and (iii) in the blockchain market in South Korea. Overall, the common ownership lambdas tend to be higher in product markets with fewer fintech firms.

Table 7 Lambdas by product market and country – upper-limit estimates

Country	Overall country lambda	Product market				
		Loans	Payments	Asset management	Insurance	Blockchain
Europe						
UK	0.0055	0.0088	0.0098	0.0026	0.0092	0.0044
Germany	0.0067	0.0069	0.0079	0.0026	0.0093	0.0124
France	0.0087	0.0131	0.0135	0.0133	0.0227	0.0035
Spain	0.0219	0.0257	0.0097	0.0643	0.0114	0.0004
Switzerland	0.0042	0.0006	0.0027	0.0011	–	0.0005
Sweden	0.0113	0.0152	0.0120	0.0629	–	–
Italy	0.0149	0.0033	0.0102	0.0453	0.0012	–
The Netherlands	0.0039	0.0022	0.0036	–	–	–
Ireland	0.0815	0.1220	0.0946	–	–	–
Estonia	0.0103	0.0240	0.0348	–	–	0.0045
Denmark	0.0842	–	0.0532	–	–	–
Americas						
US	0.0045	0.0039	0.0046	0.0046	0.0047	0.0058
Canada	0.0096	0.0110	0.0149	0.0041	0.0005	0.0097
Brazil	0.0216	0.0211	0.0196	0.0378	0.0095	0.0064
Mexico	0.0231	0.0270	0.0304	0.0377	0.0029	0.1002
Colombia	0.0007	0.0001	0.0006	–	–	–
Chile	0.0162	–	0.0213	0.0298	–	–
Argentina	0.0108	0.0052	0.0002	–	–	–
Asia						
China	0.0035	0.0065	0.0056	0.0051	0.0060	0.0006
India	0.0102	0.0116	0.0074	0.0085	0.0020	0.0077
Singapore	0.0093	0.0206	0.0054	0.0135	0.0057	0.0143
Indonesia	0.0149	0.0088	0.0118	0.0108	–	–
Japan	0.0243	0.0206	0.0252	0.0514	–	0.0187
South Korea	0.0224	0.1201	0.0705	0.0044	–	0.0419
Australia	0.0152	0.0029	0.0057	0.0179	–	0.0906
Middle East						
Israel	0.0072	0.0110	0.0095	0.0051	0.0613	0.0079
United Arab Emirates	0.0214	0.0022	0.0057	0.0226	–	–
Turkey	0.0112	0.0393	0.0112	–	–	–
Africa						
South Africa	0.0020	0.0002	0.0011	–	0.0005	–
Nigeria	0.0139	0.0082	0.0150	–	–	–
Kenya	0.0075	0.0035	0.0020	–	–	–

C. Mergers and Acquisitions and Cross-Ownership of Fintech by Common Owners

In this section, we present data on merger and acquisition (M&A) activity among common investors in fintech markets. More specifically, we provide empirical evidence on full acquisitions of fintech companies as well as minority investments in multiple rival fintech companies by the same common investor(s). Our data also illustrate in which of those full or minority acquisitions the target was a direct competitor of the common investor prior to the acquisition. The likely motivations for such acquisitions and the implications as well as the interplay of common ownership and cross-ownership are briefly discussed.

Table 8 shows the top 20 acquirers of fintech firms globally. The table shows the acquirer's name, the number of fully acquired fintech companies, the number of those fully acquired fintech companies that operated in a similar product market as the acquirer, the number of fintech companies in which the acquirer had minority ownership, and the number of those fintech companies in which the acquirer had minority ownership that operated in a similar product market as the acquirer.

Table 8 Top acquirers of fintech companies – full M&A and minority investments in fintech

Company name	Full acquisitions	Of which are competitors	Minority stake acquisitions	Of which are competitors
PayPal	7	6	35	18
Coinbase	6	6	69	63
SoFi	5	5	2	2
Visa	5	5	41	37
JP Morgan	5	4	49	29
Goldman Sachs	4	4	76	54
Nasdaq	4	2	1	0
Zip	4	4	3	3
Stripe	4	4	13	12
PayU	4	3	6	5
Mastercard	4	4	53	43
Kraken	4	4	4	4
Q2ebanking	4	4	0	0
Intercontinental Exchange	3	1	2	0
Envestnet	3	1	1	1

Table 8 *(Continued)*

Company name	Full acquisitions	Of which are competitors	Minority stake acquisitions	Of which are competitors
FTX Exchange	3	3	4	2
FIS	3	3	14	11
Nubank	3	3	0	0
Klarna	2	2	2	1
American Express	2	2	42	29

As can be seen, such acquisitions by common investors are not uncommon. Minority investment transactions are significantly more common than full acquisitions of fintech companies. Also, the great majority of the observed either full or minority acquisitions by common investors are transactions in which the acquirer is a competitor with the target (ie, there is cross-ownership). This may more plausibly be expected for instance in the case of corporate VC investors. As an example, PayPal pursued seven full acquisitions of fintech start-ups, in six of which it was considered a competitor of the target. Visa pursued five full acquisitions, in all of which it was considered to compete in the same product market as the target. On the other hand, PayPal completed 35 minority stake acquisitions, in 18 of which it was a competitor to the target. Visa undertook 41 minority stake acquisitions, in 37 of which it was a competitor to the target.

Table 9 includes only those of the top global acquirers of fintech firms from Table 8 that engage in full acquisitions while already having minority ownership in and being a competitor of the target. The table shows the acquirer's name, the number of fully acquired fintech companies in which the acquirer had minority ownership prior to the acquisition, and the number of those fully acquired fintech companies in which the acquirer had a pre-existing minority stake *and* which operated in a similar product market as the acquirer (cross-ownership). Companies listed in Table 8 that engage in no such acquisitions have been dropped from Table 9.

Table 9 Top acquirers of fintech companies – full M&A *given* prior minority investments in fintech and cross-ownership

Company name	Full acquisitions in which acquirer had minority ownership	Of which are competitors
PayPal	1	1
Visa	3	3
Zip	2	2
Stripe	1	1
American Express	1	1

These transactions seem to take place notably less often. Thus, their effect when they do occur is unlikely to be highly egregious. That said, given the rarity and relative obscurity surrounding their occurrence, these transactions may be hard to track and scrutinise. This in turn suggests that they should be more closely monitored. In addition to the motivations behind common ownership transactions outlined in section III.A above (ie, market power or efficiencies), full mergers taking place against the backdrop of common or cross-ownership may be driven by further anticompetitive or procompetitive motives. For instance, the presence of cross-ownership or common ownership may justify seemingly value-reducing mergers for the acquiring firm, because they may nonetheless be rational and efficient from the perspective of the acquirer's diversified common shareholders.[106] The latter may have parallel ownership stakes in the target and non-merging rival firms, whose gains from the acquisition may outweigh any losses incurred by the acquirer.[107] In addition, in a Cournot industry with asymmetric firms, where for instance nine competing firms are equally efficient and commonly owned while the tenth firm is separately owned and either more or less efficient than the others, a merger between the separately owned firm and the firms under common ownership 'may be driven by some efficiency benefits relating to the "shifting" of industry output towards more efficient firms'.[108] In other words, it may be motivated by 'rationalisation of production' efficiencies ('killer' merger) or by a motive to scale down or close their own less efficient operations ('suicidal' merger), depending on whether the separately owned firm is less or more efficient.[109]

Furthermore, acquisitions of start-ups by incumbent rivals may be driven by a 'killer acquisition' motive. That is, a dominant firm may acquire innovative targets to pre-empt future competition from nascent or potential competitors and protect its market power.[110] Similarly, start-up acquisitions may be justified as 'reverse killer acquisitions' in that an incumbent firm buys an innovative firm with the aim to discontinue its own related innovation efforts or projects.[111] On the other hand, acquisitions of high-tech start-up firms may be 'acqui-hires' or 'talent acquisitions', to get access to top human capital.[112] They may also

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[106] Azar and Tzanaki (n 9) 243, 250–51, 254.

[107] G Matvos and M Ostrovsky, 'Cross-Ownership, Returns, and Voting in Mergers' (2008) 89 *Journal of Financial Economics* 391; M Antón et al, 'Beyond the Target: M&A Decisions and Rival Ownership' (2022) 144 *Journal of Financial Economics* 44; *cf* J Harford, D Jenter and K Li, 'Institutional Cross-Holdings and their Effect on Acquisition Decisions' (2011) 99 *Journal of Financial Economics* 27. Although Harford et al suggest that any stake in the target may not necessarily suffice to compensate the acquirer's shareholders for losses on the acquirer side, as Matvos and Ostrovsky purport, Antón et al show that parallel stakes in non-merging rivals may more than offset any losses of the acquirer and as a result may well rationalise such transactions from the perspective of the diversified common shareholders.

[108] Azar and Tzanaki (n 9) 254.

[109] ibid.

[110] C Cunningham, F Ederer and S Ma, 'Killer Acquisitions' (2021) 129 *Journal of Political Economy* 649.

[111] Cristina Caffarra, Gregory Crawford and Tommaso Valletti, '"How Tech Rolls": Potential Competition and "Reverse" Killer Acquisitions' (*VoxEU Blog*, 11 May 2020).

[112] JF Coyle and GD Polsky, 'Acqui-Hiring' (2013) 63 *Duke Law Journal* 281.

be a means for established companies to nurture start-up growth and competition for innovative product development with the aim to eventually acquire the best of them (ie, the winner of the innovation race), essentially outsourcing early R&D activity rather than pursuing it organically.[113] This may be a way for experienced firms to partner with and mentor start-ups to facilitate new market entry, manage 'disruptive' innovation and help them navigate complex regulatory processes.[114] Furthermore, information synergies or industry and investor expertise may explain the interest of common investors and potential rivals in full or partial acquisitions of fintech.[115]

From the data at hand, it is difficult to conclude what the precise motivations behind such transactions are or what their effects may be. The fact that they occasionally occur and may have potential unintended or under-appreciated consequences for the companies involved, whose interests may not fully align with those of their minority or common investors, warrants caution and close scrutiny on the part of antitrust agencies. For instance, while start-ups may be funded by incumbents that seek to control the process of competition or innovation, with the aim to expand or kill it, it is unclear if this is bad for competition. This is a possibility if, for example, an established company like Visa can identify ex ante who may be a potential rival – yet it is hard to draw any firm conclusions from this alone, absent a concrete context.

Thus far, our analysis has concentrated on privately held fintech firms as they represent the overwhelming majority of the market in number. Our data includes almost 6,800 privately held fintech companies, of which only 340 firms went public via an IPO. To enrich and supplement the analysis, we compared common ownership in private and public markets. Therefore, we supplemented our first analysis by estimating common ownership lambdas among 77 public fintech companies in the US, the largest fintech market by fintech IPOs. Here, we included only companies that went public after 2000, are still active and have ownership data in the Capital IQ database.

Table 10 shows two examples of the top five owners in publicly listed fintech companies from our sample. This table illustrates the diversity of the largest shareholders of publicly listed fintech companies by their type. Panel A shows the ownership structure of Robinhood Markets, Inc, which went public in July 2021 and had a market capitalisation of nearly $8 billion as of September 2022. We can see that its top five owners consist of two founders of the company, two VC funds (Index Ventures SA and DST Global), and an angel investor fund (Emergent Fidelity Technologies Ltd). In contrast, PayPal, shown in Panel B,

[113] MJ Higgins and D Rodriguez, 'The Outsourcing of R&D through Acquisitions in the Pharmaceutical Industry' (2006) 80 *Journal of Financial Economics* 351.

[114] L Enriques and W-G Ringe, 'Bank–Fintech Partnerships, Outsourcing Arrangements and the Case for a Mentorship Regime' (2020) 15 *Capital Markets Law Journal* 374.

[115] D Benson and RH Ziedonis, 'Corporate Venture Capital as a Window on New Technologies: Implications for the Performance of Corporate Investors When Acquiring Startups' (2009) 20 *Organization Science* 329.

is owned by large asset management firms. The company went public in 2015 and has a market capitalisation of around $100 billion.

Motivated by these examples, we further analyse whether these differences in the composition of top shareholders by type vary depending on when the company went public and its size in terms of market capitalisation. We compare fintech companies with IPO dates before and after 2019, with each of these periods including approximately 50 per cent of companies in the sample. We observe that companies that had an IPO since 2019 are significantly more likely to have company founders among top shareholders. For instance, 42 per cent (32 per cent) of companies with IPO after 2019 have founders among their top five (three) shareholders, while 18 per cent (13 per cent) of companies with IPO before 2019 do so. Also, 42 per cent (16 per cent) of companies with IPO after 2019 have Big Three asset managers among their five (three) largest shareholders, while 51 per cent (44 per cent) of companies with IPO before 2019 have them among the top five (three) owners. In addition, we can observe that the composition of shareholders changes with the growth of companies' market capitalisation. Thirty-four per cent (24 per cent) of smaller companies and 24 per cent (18 per cent) of larger companies respectively have founders among top five (three) shareholders. Moreover, 32 per cent (18 per cent) of smaller and 63 per cent (42 per cent) of larger companies have Big Three asset management firms among their five (three) largest owners.

From this comparison, we can observe that the presence of large asset management firms among top owners is less prevalent in recently publicly listed and smaller firms. However, for fintech companies with a longer history of being public and companies with a larger market capitalisation, the presence of large asset management companies among top shareholders is more likely. This may be due to the increased probability that the company is included in a market index and a larger weight of the company in common market indices when its market capitalisation is higher. This analysis allows us to highlight the differences in shareholder structure between newly listed and mature public fintech companies and illustrates the evolution of common ownership structure during the fintech company's lifecycle.

Table 10 Top shareholders in a newly listed and a mature public fintech company

Panel A: Robinhood Markets, Inc (IPO year 2021)	
Shareholder	**% Ownership**
Bhatt, Baiju Prafulkumar (Co-Founder, Chief Creative Officer & Director)	8.83
Index Ventures SA	8.68
DST Global	6.60
Emergent Fidelity Technologies Ltd	6.39
Tenev, Vladimir (Co-Founder, President, CEO & Chairman of the Board)	6.02

(continued)

Table 10 *(Continued)*

Panel B: PayPal Holdings, Inc (IPO year 2015 (first time in 2002))	
Shareholder	% Ownership
The Vanguard Group, Inc	8.20
BlackRock, Inc	6.59
State Street Global Advisors, Inc	3.81
Comprehensive Financial Management LLC	2.75
Geode Capital Management, LLC	1.75

Table 11 shows the largest common investors in public fintech companies. If we look across all shareholders of publicly listed fintech companies in our sample that have ownership in at least 10 companies, Vanguard is the top owner in terms of average ownership share (5.36 per cent). Blackrock is in third place and State Street Global Advisors in ninth (with 3.94 per cent and 1.37 per cent average ownership shares, respectively). Here, we observe ownership patterns similar to those found in other public markets, with large asset management firms being among the largest common owners of publicly listed firms. A comparison can thus be made between private and public fintech markets based on these findings and our previous analysis. While private fintech markets do not appear to exhibit extensive common ownership, such ownership is nearly as prevalent among publicly listed fintech companies as among mature public companies in other industries that have been analysed in the literature.

Table 11 Largest common owners in public fintech companies

Shareholder name	Number of fintech companies with minority ownership	Average ownership share %
Vanguard	54	5.36
Temasek Holdings (Private) Limited	10	4.33
Blackrock	63	3.94
Capital Research and Management Company	16	3.52
Massachusetts Financial Services Company	14	2.23
T Rowe Price Group, Inc. (NasdaqGS:TROW)	40	1.97
Wellington Management Group LLP	27	1.76
Fred Alger Management, LLC	12	1.50
State Street Global Advisors, Inc	55	1.37
Dimensional Fund Advisors LP	32	0.96

Finally, we contrast the estimated lambdas in the private and public fintech markets in the US. The estimate of the common ownership lambda for US public fintech companies, weighted by the companies' market capitalisation, varies between 0.23 and 0.34. The lower-limit estimate is based on the sample of all 77 firms about which we obtained information from Capital IQ. The upper bound is estimated by including only the 48 sampled companies that publicly disclosed at least 70 per cent of their ownership structure. Under both scenarios, the lambda estimates for US public fintech companies were significantly higher than the ones we observed for private fintech markets, even those with the highest common ownership lambdas estimates, such as Ireland or Denmark. These findings suggest that public markets have a significantly higher number of common owners among a large number of companies.

IV. IMPLICATIONS FOR COMPETITION LAW ENFORCEMENT

What implications do the above findings and discussion have for competition law enforcement? The theoretical and empirical analysis offers several insights. Most notably, common ownership in fintech companies presents distinct issues and concerns during the different stages of the lifecycles of such firms, ie, at the initial start-up stage, when they are still private, versus later when they succeed and go public.

First, the degree of common ownership found among fintech start-ups and private firms is rather low. Also, the estimated impact of common ownership in private fintech markets seems limited. Thus, the empirical account portrayed here suggests there is little cause for concern regarding common shareholdings in private firms and markets. This conclusion is supported by further theoretical reasoning. On the one hand, unlike public markets where the largest asset management firms (Big Three) may automatically have minority ownership in the same index of publicly listed companies, which renders common shareholdings within a given industry extensive and systematic, the documented overlapping companies in which top investors have minority ownership in private fintech markets appear limited. Furthermore, it is no surprise that estimated lambdas for common ownership in private fintech markets are low as a matter of theory: lambdas estimations are a quadratic function of the number of connections between commonly owned firms, which by definition are exponentially higher in public markets with index funds as the number and proportion of firm pair connections are higher.

In addition, the governance structure of private companies is often ad hoc and contractually tailored in contrast to publicly listed firms, in which control rights are ordinarily allocated by operation of law ('one share-one vote' default rule) and large asset managers do not seek or participate in special control sharing arrangements (eg, board seats).[116] Moreover, the complexity of the capital

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[116] Rauterberg (n 36) 1144. This is also because asset management firms investing in publicly listed companies are subject to more restrictive and demanding regulation.

and governance structure of start-ups in particular may upset the control dynamics between investors and founders and weaken monitoring oversight within such firms.[117] This means that even though there might be overlapping investors with common shareholdings in rival fintech start-ups, these investors may not always have an interest in contracting for or exercising strong control rights over their commonly held firms. Thus, founders may be able to retain control longer while their start-ups remain private, for instance due to financing received by alternative VC investors (eg, corporate VC)[118] or due to the adoption of special governance structures such as dual class shares.[119] Such arrangements, putting insiders focused on specific firm value and performance in charge of directing the firms rather than managers that attend to portfolio-minded common diversified shareholders, may thus mitigate any procompetitive or anticompetitive effects of common ownership.[120] On the flip side, when common investors of fintech start-ups and private companies do have and exercise control (eg, especially VC investors), the control mechanism ('active' and concentrated) for them to produce competition effects and its basis (contractual rather than based on the 'residual claim' status of shareholders/principals mandated by corporate law) may be more easily observable and thus more easily enforceable by antitrust agencies within established frameworks.[121]

By contrast, common ownership in public fintech firms and markets seems more extensive and potentially more worrisome. Once fintech firms mature and successfully go public, common ownership takes on different qualities and characteristics that require tailored assessment. Public firm governance allows for more transparency and accountability as such firms are subject to tighter regulation.[122] Common investors, even 'passive' institutional investors with diffuse diversified shareholdings in rivals, may under certain conditions (eg, size and distribution of other shareholders) be able to implement their anticompetitive incentives.[123] This can occur regardless of the existence of managerial agency costs in large public corporations or legal constraints such as corporate law fiduciary duties which cannot be violated in cases where non-diversified shareholders also come to gain from the anticompetitive outcomes that common ownership produces.[124] Most importantly, however, the common ownership patterns observed in public fintech firms resemble, both empirically and analytically, those found in other

[117] Pollman (n 37); A Alon-Beck, 'Alternative Venture Capital: The New Unicorn Investors' (2020) Case Legal Studies Research Paper No 2020-26.

[118] Alon-Beck (n 117).

[119] V Battocletti, L Enriques and A Romano, 'Dual Class Shares in the Age of Common Ownership' (2022) European Corporate Governance Institute Law Working Paper No 628.

[120] ibid; Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6).

[121] See above (nn 37–39) and surrounding text; Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6).

[122] Alon-Beck (n 117).

[123] Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 6).

[124] ibid.

public markets (eg, airlines, banks) in that the largest fintech firms – once they succeed and go public – are incorporated into common ownership networks (eg, of index fund portfolios). In these instances, as suggested elsewhere, competition policy and enforcement need to intelligently develop to effectively address the novel 'diffuse' common shareholding phenomenon.[125]

Furthermore, antitrust risks from common ownership in fintech markets arise not only when fintech firms become public (eg, after a successful IPO), but also when they are acquired through M&A. Both full acquisitions and minority investments in fintech need to be monitored by antitrust enforcers since they can result in common ownership and/or cross-ownership. These investments bring about an additional layer of competition risks and strategic concerns that may be underestimated if the M&A regulatory assessment completely abstracts from and disregards the surrounding context where pre-existing common shareholding or cross-shareholding is observed.[126]

All in all, the level of common ownership in fintech markets varies and its effects are mixed. While the phenomenon is likely more limited and ad hoc in fintech start-ups and any harm potential is likely small and isolated in such cases, competition concerns may become more real and significant in public firms or in smaller product or national markets where common ownership networks appear denser. Overall, these results underline the importance of careful, case-specific analysis of common ownership among fintech firms using the proper analytical frame and empirical context as outlined in this chapter. Here, the types of firms, investors and markets as well as the quality of available data (on financing, ownership, governance and M&A deal structures) are critical parameters for a well-informed assessment of common ownership cases by antitrust agencies. Such a case-by-case, empirically informed approach would naturally add complexity to competition analysis, but without it, competition policy risks being not only obsolete but seriously misguided. This is an important lesson for competition policymakers not merely in cases relating to common ownership in the narrow sense, but also as regards M&A transactions more broadly and thus merger control enforcement.[127]

V. CONCLUSION

Is common ownership in fintech markets of any magnitude and significance? This chapter answers these questions by reference to newly accumulated empirical data and theoretical analysis, arriving at interesting and novel conclusions. First, the observed ownership and governance structures among fintech start-ups

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[125] ibid.
[126] See section III.C above.
[127] Azar and Tzanaki (n 9).

and private firms suggest that common ownership is likely to raise little cause for concern. The largest fintech investors globally and by country have limited overlaps in such firms and common shareholdings are not as prevalent as in public markets. Moreover, common VC investors in start-ups are often seen to have a beneficial role for innovation, knowledge diffusion and overall welfare.

However, the picture changes substantially with fintech firms going public and becoming more mature. The ownership composition of these firms is different: while VC and private equity investors dominate private fintech firms, large asset management funds are often the largest owners in publicly listed fintech companies. Governance and control are more standardised and a function of voting power by operation of corporate law rather than contract. Most importantly, the extent and likely impact of common ownership in public fintech firms is likely significant because of the systematic presence of (quasi) index funds and widely overlapping investors in public markets. In this sense, common ownership patterns observed in public fintech firms resemble those found in other public markets (eg, airlines and banks), which may raise concerns for competition policymakers. In addition, strategic motives for fintech start-up acquisitions by common investors with several rival firms in their portfolio or by acquirers who are also a competitor of the target (cross-ownership) may add to the competition concerns and deserve more attention.

Competition law enforcement needs to take stock of this evidence and account for the differences in the types of firms, investors and markets where common shareholdings are present. Further, the distinct implications of common shareholding for both competition and innovation need to be considered in dynamic industries such as fintech. Overall, case-by-case and empirically driven analysis seems a more promising and balanced approach to address the competition implications of common ownership in fintech markets.