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Common Ownership Patterns in the European Banking Sector – The Impact of the Financial Crisis

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Common Ownership Patterns in the European Banking Sector – The Impact of the Financial Crisis[1]

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ABSTRACT

We provide a description of ownership patterns in the top 25 European banks for the period 2003–2015, where we especially focus on the global financial crisis. Investment managers, such as Blackrock, are dominant in terms of number of blockholdings in different banks, maintaining fairly stable "common ownership" networks throughout our sample. However, the financial crisis led to capital injections by governments in several banks in trouble, which in turn led to a jump in holdings by governments, which typically are "non-common owners" (i.e., they hold only shares in only one bank). This jump translated into these investors temporarily being the top investor with a large share, and non-common owners being the majority among large shareholders. A brief comparison with US banks uncovers large ownership differences between the European and US banking sectors. We briefly discuss what these ownership patterns might imply for competition, stability and performance in the banking industry.

JEL: G21, G23, G28, G32. K21, L4

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I. INTRODUCTION

This paper describes the ownership patterns in the largest 25 European banks for the period 2003–2015. We analyze, in particular, the (changing) position of the "common owners," i.e., the investors that hold ownership holdings in several banks at once. Common ownership is steeply rising in all economies and all sectors. It can often be traced back to the investment managers' increased holdings in listed companies, with BlackRock and Capital Group as prominent examples (Fichtner et al., 2017; Seldeslachts et al., 2017; Backus et al., 2019).[2] Common ownership has been dubbed by many commentators "the major new competition policy challenge of our time," as commonly owned companies might have less incentives to compete (Posner et al., 2016; Schmalz, 2018; Elhauge et al. 2021).[3]

We concentrate on the banking sector because of its special role in the economy (Freixas and Rochet, 2008).[4] Moreover, given that banks are a key channel to transmit and amplify systemic shocks, common ownership networks might augment these transmission mechanisms. The banking sector is especially important in Europe (De Fiore and Uhlig, 2005).[5] The European economy has greater dependency on bank intermediation than many other economies and, as a result, the European banking sector is large by international comparison.

We especially focus on the 2007-2009 Global Financial Crisis (GFC). Banks are particularly sensitive to financial crises due to their systematic vulnerabilities because of their leverage levels and maturity mismatch. The GFC had, indeed, a profound impact on European banks (de Haan and Kakes, 2020), especially large banks, as highlighted in the Liikanen report.[6,7] Given that large banks can create systemic risk, they may be "too big to fail," and thus more likely to be subject to governmental intervention during crises.[8] Therefore, the GFC could reveal significant changes in the ownership patterns in large European banks.

We document that the GFC had a large but temporary effect on the top owners and the networks of common ownership in the European banking sector. Local governments took large equity holdings during the financial crisis in some of the banks that were most in trouble. These local governments initially responded with largely ad hoc measures tailored to the individual needs of institutions that had suffered large losses. However, as the crisis intensified and became more systemic in nature, interventions were extended to a broader range of banks, with the introduction of comprehensive support schemes at the national level. Still, the take-up rate was very heterogenous, both within and across countries (Stolz and Wedow, 2011). Further, these governmental interventions aimed to provide capital on a temporary basis, and thus often included an exit strategy. We illustrate different ownership patterns by showing the top holdings for some banks in our sample from the UK, Spain and Sweden, which are among the best represented countries in our sample.

Governments typically hold shares in only one bank and are thus "non-common owners." Investment managers, on the other hand, barely changed their holdings during the GFC. As a result, the financial crisis led non-common owners to temporarily hold the majority stake in the average European bank, vis-à-vis the common owners' joint holdings. This ownership shock led to substantial reductions in the standard common ownership incentive measure "lambda," and in the density of the common owners' networks. Nevertheless, while some banks kept on having governments or corporations as top holders in the post-crisis period, the density of the networks of common ownership among the largest European banks increased rapidly after the crisis as the investment managers' importance keeps on growing globally.

We also briefly compare the trends in the European banks with comparable US banks for the same period. In the US banks, investment managers are much more present, whereas governments, corporations and individuals are virtually non-existent. The GFC had also virtually no impact on these US patterns. Thus, in US banks common owners are both (much) more powerful and their presence is more stable.

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[2] Fichtner, J., Heemskerk, E. M., & Garcia-Bernardo, J. (2017). Hidden power of the Big Three? Passive index funds, re-concentration of corporate ownership, and new financial risk. *Business and Politics*, 19(2), 298-326. Seldeslachts, J., Newham, M., & Banal-Estanol, A. (2017). Changes in common ownership of German companies. *DIW Economic Bulletin*, 7(30), 303-311. Backus, M., Conlon, C., & Sinkinson, M. Common Ownership in America: 1980–2017. *American Economic Journal: Microeconomics*.

[3] Posner, E. A., Scott Morton, F. M., & Weyl, E. G. (2016). A proposal to limit the anticompetitive power of institutional investors. *Antitrust LJ*, 81, 669. Schmalz, M. C. (2018). Common-ownership concentration and corporate conduct. *Annual Review of Financial Economics*, 10, 413-448. Elhauge E., Majumdar S., Schmalz M. Confronting Horizontal Ownership Concentration. *The Antitrust Bulletin*. 2021;66(1):3-11.

[4] Freixas, X., & Rochet, J. C. (2008). Microeconomics of banking. *MIT press*.

[5] De Fiore, F., & Uhlig, H. (2011). Bank finance versus bond finance. *Journal of Money, Credit and Banking*, 43(7), 1399-1421.

[6] de Haan, L., & Kakes, J. (2019). European banks after the global financial crisis: Peak accumulated losses, twin crises and business models. *Journal of Banking Regulation*, 1-15.

[7] Liikanen, E. (2012). High-level Expert Group on reforming the structure of the EU banking sector. Final Report, Brussels.

[8] Beck, T. H. L., Coyle, D., Dewatripont, M., Freixas, X., & Seabright, P. (2010). Bailing out the banks: reconciling stability and competition. CEPR.

We further discuss what several of the observed patterns might imply for competition, banks' performance and the banking industry's stability. In particular, we touch upon common ownership's impact on competition and stability, the interplay between a large non-common investor and a coalition of smaller non-common investors, and the impact of ownership concentration on bank valuation.

The paper is structured as follows. Section II presents our data and shows the ownership stakes of the top investors and top blockholders before, during and after the GFC. Section III gives some background on potential drivers behind the observed ownership changes and gives examples of individual banks and countries. Section IV introduces our measures of common ownership and shows the patterns therein over time. Section V briefly compares the European patterns with the largest US banks. Section VI discusses potential implications for competition, stability and performance. Section VII concludes.

II. DATA

In this section, we present the sample of banks we use in our study, as well as the source and structure of the ownership data.

A. Bank sample selection

Our analysis uses the 25 largest publicly listed banks in Europe, based on total assets at the end of 2015, shown in Table 1.[9],[10] Several large banks are not included in our sample because, while they rank among the top banks measured by total assets, they are either not publicly listed or are not listed during most of the reference period.[11]

Table 1. Top 25 banks in Europe

No	Bank	Country	Total assets (2015, US$b)	Rank by market capitalization (2015)	G-SIB (Nov 2015)
1	HSBC Holdings	UK	2,410	1	YES
2	BNP Paribas	FR	2,180	4	YES
3	Crédit Agricole Group	FR	1,858	16	YES
4	Deutsche Bank	DE	1,781	13	YES
5	Barclays PLC	UK	1,660	6	YES
6	Banco Santander	ES	1,465	3	YES
7	Société Générale	FR	1.459	14	YES
8	Royal Bank of Scotland Group	UK	1,208	8	YES

[9] We define Europe as the EU 27 plus the United Kingdom, as member of the EU during the period of our sample, and Norway and Switzerland, as members of the European Free Trade Association (EFTA), with strong trade and economic ties.

[10] Total assets is arguably the most commonly used measure of bank size, with the downside that this measure is subject to different accounting and measurement rules. We therefore also show in the Table the banks' rank by market capitalization and identify whether the bank is a global systemically important bank (G-SIB), defined by the Financial Stability Board (FSB) based on four main criteria: size, cross-jurisdiction, complexity and substitutability. See also Laeven, L., Ratnovski, L., & Tong, H. (2016). Bank size, capital, and systemic risk: Some international evidence. *Journal of Banking & Finance*, 69(S1), 25-34.

[11] In particular, Groupe BPCE, Crédit Mutuel, Rabobank, KfW Group, DZ Bank and Landesbank Baden-Württemberg are part of the European top banks, but are not publicly listed or have been delisted. Cassa Depositi e Prestiti is also a top European bank, but is a joint-stock company under public control in Italy. The top bank ABN AMRO Group, finally, was delisted in 2008 and listed again in late 2015 and is therefore not included in the sample.

9	Lloyds Banking Group	UK	1,195	2	NO*
10	UBS AG	CH	954	5	YES
11	UniCredit S.p.A.	IT	941	12	YES
12	ING Group	NL	920	-	YES
13	Credit Suisse Group	CH	831	11	YES
14	BBVA	ES	820	9	NO*
15	Intesa Sanpaolo	IT	740	7	NO
16	Nordea Bank	FI	707	10	YES
17	Standard Chartered Plc	UK	640	-	YES
18	Commerzbank AG	DE	582	-	NO*
19	Danske Bank	DK	483	15	NO
20	CaixaBank	ES	376	-	NO
21	Svenska Handelsbanken	SE	300	17	NO
22	DNB Group	NO	296	-	NO
23	Skandinaviska Enskilda Banken	SE	297	-	NO
24	KBC Group NV	BE	276	-	NO
25	Swedbank	SE	256	18	NO

Note: In the G-SIB column, NO* means the bank was not a G-SIB at the end of our sample in 2015 but was at some point in our sample period.
Source: Based on annual reports, Relbanks.com publishes rankings of banks by total assets based and market capitalization.

As shown by the Table, the banks in our sample are spread across many European countries: the UK (5), France (3), Spain (3), Sweden (3), Germany (2), Italy (2), Switzerland (2), Belgium (1), Denmark (1), Finland (1), the Netherlands (1) and Norway (1).

In a short comparison, we will make use of a comparable set of US banks. Table 2 shows the 10 largest publicly listed banks in the United States. The European and US samples are comparable in terms of total assets: the 11th largest publicly traded US bank would be smaller than the 25st European bank in the sample.

Table 2. Top 10 banks in the United States

No	Bank	Country	Total assets (2015, US$b)	Rank by market capitalization (2015)	G-SIB (Nov 2015)
1	J.P.Morgan Chase & Co	US	2,352	2	YES

2	Bank of America	US	2,144	3	YES
3	Wells Fargo & Company	US	1,788	1	YES
4	Citigroup	US	1,731	4	YES
5	Goldman Sachs Group	US	861	5	YES
6	Morgan Stanley	US	787	7	YES
7	U.S. Bancorp	US	422	6	NO
8	Bank of New York Mellon	US	394	9	YES
9	PNC Financial Services	US	358	8	NO
10	Capital One	US	334	10	NO

Source: Based on annual reports, Relbanks.com publishes rankings of banks by total assets based and market capitalization.

B. Ownership data

We use the Thomson Reuters Global Ownership Database, which includes holdings by each shareholder in each publicly listed firm worldwide for every year-quarter. For firms outside of the US, information is sourced from stock exchange filings, trade announcements, company websites, company annual reports and financial newspapers. For the US, Thomson Reuters collects ownership information from 13F, 13D and 13G filings, and forms 3, 4, and 5.[12]

While our database does not suffer from reported data problems of the Wharton Research Data Services (WRDS) Thomson Reuters data, we modify it to account for (i) name changes that occur, mainly through investors' (full or partial) M&As during the sample period and to (ii) identify ultimate decision makers (mainly based on their names).[13] In other words, we classify investors at the ultimate owner level, since it is at this level that decision power lies.

Our time period runs from 2003 to 2015, and thus includes several years prior and after the GFC. Following Thakor (2015), we define the crisis period as running from the second quarter of 2007, with large-scale withdrawals of short-term funds from various markets previously considered safe, until the second quarter of 2009 (the end of the recession in the Eurozone).[14] Note that our sample also includes the post-GFC debt crisis, a multi-year debt crisis which affected some Southern European states, but not the whole of Europe, since the end of 2009.

For each bank in our sample and for each quarter in the period 2003-2015, we obtain the data on the ultimate owners that own at least 1 percent of the shares of the bank, as this is arguably the minimum threshold through which

[12] Our data set has considerable advantages over to Thomson's Spectrum database used by most other papers on common ownership. The Thomson's Spectrum database is limited to 13F filings, which contains only large investors in U.S. listed companies. Moreover, the Thomson's Spectrum database shows holdings assigned to the owner that filed the 13F. This is what is commonly referred to as an "as-filed view." Our database utilizes a "money-manager view." With this view, the database combines together one or more filings to link the holdings to the actual firm that manages the investments. In other instances, it might break apart a single filing in order to accomplish the same. The holdings would then be assigned to one or more of the managers listed on the file.

[13] For a detailed explanation of our data and dynamic assignment of ultimate owners, see data repository: https://www.openicpsr.org/openicpsr/project/120781/version/V1/view attached to the paper Banal-Estañol, A., Seldeslachts, J., & Vives, X. (2020). Diversification, Common Ownership, and Strategic Incentives. *AEA Papers and Proceedings*, 110, 561-64.

[14] Thakor, A. V. (2015). The financial crisis of 2007–2009: why did it happen and what did we learn?. *The Review of Corporate Finance Studies*, 4(2), 155-205 and Uhlig, H. (2010). Euro Area Business Cycle Dating Committee: Determination of the 2009 Q2 Trough in Economic Activity. Retrieved from: http://www. voxeu. org/article/when-did-eurozone-recession-end.

owners can have influence. We rely on how Thomson Reuters classifies investors into different types and subtypes. Based on this classification, we aggregate investor types into 3 categories:[15]

- (i) *Investment managers* – when investors are classified as "Investment Managers" in Thomson Reuters. This category includes banks and trusts, hedge funds, insurance companies, investment advisors, pension funds, private equity funds, sovereign wealth funds, and venture capital funds. Examples of some of the most frequent investment managers in our sample are BlackRock, an investment advisor, and NBIM (Norges Bank Investment Management), a sovereign wealth fund.

- (ii) *Individual investors and corporations* – when investors are classified as "Individual investors" or as "Corporations." Examples, among others, can be found in the Spanish bank BBVA, whose top investors include Spanish Telecom company Telefónica (a corporation) and the property developer Manuel Jove (an individual).

- (iii) *Governments and government agencies* – when an investor is classified as "Government Agency".[16] UK Financial Investments Ltd and the Belgian Government are examples of Government Agencies in our sample.

In a first step in showing investors and their individual stakes, Table 3 shows the top 15 investors by % holdings in the beginning of our sample (2003Q1), end of the financial crisis (2009Q3) and end of our sample (2015Q4). As a first general observation, the top investors in European banks have very large stakes (even up to 96% of SAS Rue La Boétie in Crédit Agricole in 2003Q1). These top investors can be corporations and other institutions, such as SAS Rue La Boétie or Fundación la Caixa, or government agencies such as UK Financial Investments. Government agencies rise during the financial crisis (their number increases from two in 2003Q1 to five in 2009Q3), but there is a trend of de-investment by governments afterwards (there are only three remaining in 2015Q4). Investment managers are also present in the top 15 lists but have in general lower stakes. Most of these investment managers are domestic, in the sense that the investor and the bank come from the same country, and most are from Scandinavia. The only exceptions are Temasek from Singapore (with stakes in Standard Chartered in both 2009Q3 and 2015Q4) and Capital Group from the US (with a stake of 11% in Barclays in 2015Q4).

In a first step in showing investors and their multiple holdings, Table 4 shows the top 15 investors by the number of blockholdings they hold (1%, 3% and 5%; where the Table is ranked by the 3% measure). The pattern that emerges here is drastically different from what we see in the top investors by % holding. First, apart from one exception (UK Financial Investments, a government agency with two blockholdings), all investors with more than one blockholding are investment managers. Second, whereas the financial crisis does increase to some extent the number of smaller blockholdings in the list (1%), the top investors in 2015Q4 have many more blockholdings than in the beginning of our sample. Notably Blackrock and Capital Group, both from the US, and NBIM, the Norwegian sovereign wealth fund, have risen fast in the ranking and have many more holdings than the top blockholders in 2003Q1. It is this difference, large stakes of non-common investors, as shown in Table 3, versus multiple stakes of common investors, as shown in Table 4, that we will further investigate in this paper.

[15] This means also that every subsidiary will be assigned to the same category as its ultimate owner. We assigned the label of the ultimate owner to all subsidiaries. This means that for example "Blackrock Asset management Deutschland AG" and "BlackRock Investments Canada Inc." get the label assigned of "BlackRock".

[16] Since Thomson Reuters classifies Sovereign Wealth funds, such as NBIM, as Investment managers, we include these in the investment manager category.

Table 3. Top 15 investors by % holdings in 2003Q1, 2009Q3 and 2015Q4

Investor	Country	Type	%	Bank	Investor	Country	Type	%	Bank	Investor	Country	Type	%	Bank
2003Q1					***2009Q3***					**2015Q4**				
SAS Rue La Boétie	FR	IC	96%	Crédit Agricole	Fundación la Caixa	ES	IC	80%	Caixabank	UK Financial Investments	UK	GO	73%	RBS
KBC Asset Mgmt	BE	IM	71%	KBC	UK Financial Investments	UK	GO	70%	RBS	Fundación la Caixa	ES	IC	57%	Caixabank
Norwegian Government	NO	GO	47%	DNB	SAS Rue La Boétie	FR	IC	55%	Crédit Agricole	SAS Rue La Boétie	FR	IC	57%	Crédit Agricole
Swedbank	SE	IM	30%	Swedbank	UK Financial Investments	UK	GO	43%	Lloyds	Norwegian Government	NO	GO	34%	DNB
Investor AB	SE	IM	21%	SEB	Norwegian Government	NO	GO	34%	DNB	Swedbank	SE	IM	25%	Swedbank
Generali	IT	IM	16%	Intesa Sanpaolo	Cera	BE	IC	30%	KBC	A.P. Moller Foundation	DK	IC	22%	Danske Bank
A.P. Moller Foundation	DK	IC	16%	Danske Bank	German Government	DE	GO	25%	Commerzbank	Sampo	FI	IM	21%	Nordea
Amundi Asset Mgmt.	FR	IM	15%	Intesa Sanpaolo	A.P. Moller Foundation	DK	IC	22%	Danske Bank	Cera	BE	IC	21%	KBC
Realdania	DK	IM	15%	Danske Bank	Investor AB	SE	IM	21%	SEB	Investor AB	SE	IM	21%	SEB
Swedish Government	SE	GO	15%	Nordea	Swedbank	SE	IM	20%	Swedbank	Temasek	SG	IM	16%	Standard Chartered
Khoo Teck Puat	SG	IC	13%	Standard Chartered	Swedish Government	SE	GO	20%	Nordea	German Government	DE	GO	16%	Commerzbank
Fondazione Cariverona	IT	IC	13%	Unicredit	Sampo	FI	IM	20%	Nordea	M.R.B.B.	BE	IC	11%	KBC
Fondazione CRT	IT	IC	11%	Unicredit	Temasek	SG	IM	18%	Standard Chartered	Capital Group	US	IM	11%	Barclays

Note: IM stands for Investment Managers, IC for Individuals & Corporations and GO for Government Agency. Investors in the table are those with the largest percentage held in a bank.

Table 4. Investors with top15 blockholdings of 1, 3 and 5% (ranked by the 3% measure)

Investor	Country	Type	5%	3%	1%	Investor	Country	Type	5%	3%	1%	Investor	Country	Type	5%	3%	1%
2003Q1						***2009Q3***						***2015Q4***					
Legal & General	UK	IM	0	3	5	Swedbank	SE	IM	1	4	4	BlackRock	US	IM	13	14	17
Alecta	SE	IM	0	3	4	Legal & General	UK	IM	0	3	5	Capital Group	US	IM	2	3	8
Generali	IT	IM	2	2	4	QIC	QA	IM	2	2	2	Swedbank	SE	IM	1	3	4
Swedbank	SE	IM	1	2	3	UK Financial Investments	UK	GO	2	2	2	NBIM	NO	IM	0	3	19
Deutsche Bank	DE	IM	1	2	2	Generali	IT	IM	1	2	3	UK Financial Investments	UK	GO	2	2	2
Amundi Asset Mgmt.	FR	IM	1	1	3	Allianz	DE	IM	1	2	2	Alecta	SE	IM	1	2	4
AXA Group	FR	IM	1	1	3	Alecta	SE	IM	1	2	2	Aberdeen Asset Mgt	UK	IM	1	2	3
Realdania	DK	IM	1	1	1	Capital Group	US	IM	0	2	11	Dodge & Cox	US	IM	0	2	7
Khoo Teck Puat	SI	IC	1	1	1	BlackRock	US	IM	0	2	4	AMF Pension	SE	IM	0	2	4
Industrivärden	SE	IM	1	1	1	Nordea	FI	IM	1	1	4	QIC	QA	IM	0	2	2
WCM AG	DE	IC	1	1	1	Fidelity	US	IM	1	1	4	UBS	CH	IM	1	1	4
Tryggstiftelsen	SE	IC	1	1	1	DnB NOR	NO	IM	1	1	2	Credit Suisse	CH	IM	1	1	3
Putnam Investments	US	IM	1	1	1	Swedish Government	SE	GO	1	1	1	Cera	BE	IC	1	1	1
Société Générale	FR	IM	1	1	1	Industrivärden	SE	IM	1	1	1	Industrivärden	SE	IM	1	1	1
Allianz	DE	IM	1	1	1	M.R.B.B.	BE	IC	1	1	1	J.P. Morgan Chase	US	IM	1	1	1

Note: IM stands for Investment Managers, IC for Individuals & Corporations and GO for Government Agency.

III. THE IMPACT OF THE GFC ON THE OWNERSHIP STRUCTURE OF EUROPEAN BANKS

This section provides first a description of the effects of the GFC in the evolution of the ownership structure of the European banks and provides illustrating examples, and then shows general trends.

A. Description and illustrative examples

Financial institutions suffered severe damage during the GFC, widely considered the most serious financial crisis since the Great Depression. Funding markets dried up, there were severe solvency concerns about individual financial institutions and about the whole financial system. In October 2008, governments stepped in and started adopting a series of support measures. These can be classified into three main categories: guarantees on bank bonds, measures to provide relief from legacy assets, and, the most relevant in terms of ownership, capital injections in exchange of shares (Stolz and Wedow, 2013).[17]

Governments initially responded with largely ad hoc measures tailored to the individual needs of institutions that had suffered large losses. However, as the crisis intensified and became more systemic in nature, interventions were extended to a broader range of banks, with the introduction of comprehensive support schemes. Still, the take-up rate was very heterogenous, both within and across countries. The largest part of the financial support was targeted to a relatively small number of institutions. For instance, 37% of the capital injection support in the countries of the euro area was absorbed by the largest three recipient institutions (Stolz and Wedow, 2011).[18]

The recapitalisations aimed to provide capital on a temporary basis, and thus often included an exit strategy. Indeed, the approach in the EU, following the advice of the European Central Bank (ECB), was to provide banks with the incentive to return public funds promptly. In addition, uniform exit arrangements were a central consideration under the European Commission's (EC) approval process of governments' support measures to financial institutions.[19]

In general, there are two approaches to the exit from government interventions. First, the government sells its stake directly to the private market. The Swiss government, for instance, sold its €4 billion stake in UBS to institutional investors in August 2009, and the US government sold stocks acquired in Citigroup in several transactions beginning in May 2010. Second, the bank repays the government, raising capital from private markets, for instance, as the French banks did. In both cases, the ownership stakes of the investment managers may rise as a result as these are big buyers in equity markets; more on this aspect also below (Stolz and Wedow, 2013).

The level of involvement in banks that received capital injections of the same country was very heterogeneous.[20] We illustrate this heterogeneity in the evolution of the ownership structure of the European banks, and in particular the heterogeneity of the government's capital injections during the GFC. We start with three of the UK banks, as the UK banks received the largest volume of government capital. While some banks, such as HSBC, performed well during the crisis and hence did not need much governmental aid, others, such as RBS and Lloyds, performed worse and benefited from major public aid.[21] Exit was also heterogeneous. The government began selling off its stake in Lloyds in 2013 and, by April 2017, the £20.3bn spent bailing out Lloyds had been re-paid.[22] On the other hand, in June 2018, the government was selling shares at half of the it price it had previously paid in the bailout of RBS and it still held a majority stake.[23]

Table 5 shows how these actions are reflected in the ownership patterns. The financial crisis catapulted UK Financial Investments, a government agency, to top investor in Lloyds with a share of 43% (see 2009Q3). It stayed #1 in 2015Q4, but with a much smaller stake (10%), whereas investment managers like BlackRock and NBIM entered the top 5 with larger holdings than the top investors' pre-crisis holdings. HSBC, on the other hand, sees no governmental

[17] Stolz, S.M. & Wedow, M. (2013). Keeping banks afloat: public lifelines during the financial crisis. *International Economics and Economic Policy*, 10(1), 81-126.

[18] Stolz, S.M. & Wedow, M. (2011). Government measures in support of the financial sector in the EU and the United States. *Intereconomics*, 46(1), 53-60.

[19] National interventions to sustain private companies require approval by the EC under the European "State aid" rules (https://www.eca.europa.eu/lists/ecadocuments/ap19_05/ap_state_aid_en.pdf).

[20] In a number of cases, banks became de facto nationalised, when governments obtained majority stakes in them, Besides an overall limit given by the commitments to a specific measure, some jurisdictions, such as Germany, established individual limits for the support of banks. The maximum limit for recapitalisations was set at €10 billion.

[21] https://www.ft.com/content/dd74c8a6-c740-11e4-9e34-00144feab7de

[22] Jack, S. "Government loses £2.1bn on RBS stake sale", BBC News, 21 April 2017. Retrieved from: https://www.bbc.com/news/business-39671843.

[23] Hotten, R. "Lloyds: £20bn taxpayer bailout repaid, says Hammond", BBC News, 5 June 2018. Retrieved from: https://www.bbc.com/news/business-44366731.

intervention, but one can see the rise of investment managers towards the end of our sample, again with especially BlackRock but also again NBIM. RBS, finally, just sees the government entering, which stays and even increases its holdings towards the end of our sample, with an astonishing 73%.

Table 5. Top 5 shareholders of selected UK banks

HSBC

2003Q1	%	2009Q3	%	2015Q4	%
Legal & General	3%	J.P. Morgan Chase	6%	BlackRock	7%
Hong Kong Monetary Authority	2%	Legal & General	3%	J.P. Morgan Chase	5%
Standard Life	2%	Barclays Global Investors	3%	Legal & General	3%
M&G Investments	1%	Credit Suisse	3%	NBIM	2%
Lloyds Banking Group	1%	Saad Financial Services	2%	State Street Global	1%

Lloyds

2003Q1	%	2009Q3	%	2015Q4	%
Legal & General	3%	UK Financial Investments	43%	UK Financial Investments	10%
Aviva	2%	Barclays Global Investors	1%	BlackRock	5%
Standard Life	2%	Capital Group	1%	NBIM	3%
Capital Group	2%	Legal & General	1%	Legal & General	2%
M&G Investments	2%			Vanguard	2%

RBS

2003Q1	%	2009Q3	%	2015Q4	%
Legal & General	3%	UK Financial Investments	70%	UK Financial Investments	73%
BlackRock	3%	Capital Group	2%	Artisan Partners	2%
Aviva	3%	Legal & General	1%	T. Rowe Price	1%
Standard Life	3%				
Lloyds Banking Group	2%				

Note: Fewer than 5 investors appears if there are no other investors present with more than one percent of shares.

As a next illustration we zoom in on two Spanish banks in our sample. In Spain, it is important to distinguish between the large banks and the savings banks (or *cajas*): the former performed relatively well while the latter suffered tremendously from the GFC. The largest banks, such as BBVA and Santander, did not face significant problems and did not receive capital injections (Santos, 2014).[24] Table 6 shows the top 5 investors in BBVA and Santander, where we see indeed that BBVA and Santander did not see the entry of governments because of the GFC, but on the other hand saw the investment managers' slow rise. We see that BBVA experienced the rise of investment managers by the end of

[24] Bankia, a large savings bank, ended up requiring a €24 billion capital injection, the largest bank nationalisation bailout in the history of Spain. However, Bankia, as other savings banks are not publicly owned and does not appear in our data. We also do not show here Caixabank, as it only becomes public in 2007. Santos, T. (2014). "Antes del diluvio: the Spanish banking system in the first decade of the euro", paper presented at the Conference in honour of José A. Scheinkman, New York, March, https://www0.gsb.columbia.edu/mygsb/faculty/research/pubfiles/6162/Santos-March-2014.pdf

our sample, with BlackRock as top holder and NBIM in the top 5. Also Santander sees the typical investment managers rising (BlackRock and NBIM).

Table 6. Top 5 shareholders of selected Spanish banks

BBVA

2003Q1	%	2009Q3	%	2015Q4	%
Telefónica	1%	Manuel Jove Capellán	4%	BlackRock	5%
		Barclays Global Investors	3%	Marathon Asset Mgmt	2%
				Vanguard	2%
				Mellon Financial	2%
				NBIM	1%

Santander

2003Q1	%	2009Q3	%	2015Q4	%
Royal Bank of Scotland	3%	Capital Group	5%	BlackRock	5%
António Champalimaud	2%	Barclays Global Investors	3%	NBIM	2%
Generali	2%	Generali	2%	Vanguard	2%
Fundación Botín	1%	Emilio Botín	2%	Mellon Financial	1%
		State Street Global	2%		

Note: Fewer than 5 investors appears if there are no other investors present with more than one percent of shares.

As a third example, Swedish banks were not immune to the GFC, but fared well compared to banks of other countries. Swedish banks experienced more manageable losses than did their European counterparts. The Swedish banking system may have held up because the pain of the early 1990s crisis there was severe enough as to scar both bank executives and regulators, leaving them with little temptation to take the same risks as banks elsewhere. The Swedish government implemented a capital injection program to boost bank lending (Sveriges Riksbank, 2020).[25] However, this barely affected the ownership structure of the banks, as the Swedish model of corporate ownership and control are such that control is concentrated in a few local investors (Henrekson and Jakobsson, 2005). [26] Swedish banks also bounced back quickly. By 2011, the Swedish economy was growing rapidly, creating jobs and gaining a competitive edge, which led to Swedish banks recovering quickly too.[27] These tendencies are also reflected in the ownership patterns. As one can see from Table 7, the top 5 owners and their shares barely move. Perhaps as important, all these investors, with the notable exception of Capital Group (US) and Erste Sparinvest (Austria), are local Swedish investors.

[25] Riksbank, Sveriges. "The Riksbank's measures during the global financial crisis 2007–2010." Riksbank Study, Sveriges Riksbank (2020).
[26] Henrekson, M., and Jakobsson, U. (2005). The Swedish model of corporate ownership and control in transition. *Who will own Europe*, 207-246.
[27] https://www.washingtonpost.com/business/economy/five-economic-lessons-from-sweden-the-rock-star-of-the-recovery/2011/06/21/AGyuJ3iH_story.html

Table7. Top 5 shareholders of selected Swedish banks

Skandinaviska Enskilda Banken

2003Q1	%	2009Q3	%	2015Q4	%
Investor AB	21%	Investor AB	21%	Investor AB	21%
Tryggstiftelsen	10%	Tryggstiftelsen	10%	Alecta	6%
Alecta	2%	Alecta	6%	Tryggstiftelsen	6%
AFA Försäkring	2%	Swedbank	5%	Swedbank	4%
Skandia	2%	Capital Group	3%	AMF Pension	3%

Svenska Handelsbanken

2003Q1	%	2009Q3	%	2015Q4	%
Stiftelsen Oktogonen	9%	Stiftelsen Oktogonen	11%	Stiftelsen Oktogonen	10%
Industrivärden	7%	Industrivärden	10%	Industrivärden	10%
Swedbank	5%	Alecta	4%	Swedbank	4%
AMF Pension	4%	Swedbank	3%	Lundbergs	2%
Alecta	4%	AFA Försäkring	3%	Capital Group	2%

Swedbank

2003Q1	%	2009Q3	%	2015Q4	%
Swedbank	30%	Swedbank	20%	Swedbank	25%
Alecta	5%	Folksam	9%	Alecta	5%
Lantbrukarnas Riksförbund	3%	Svensk Exportkredit	3%	AMF Pension	4%
AFA Försäkring	2%	Erste-Sparinvest Kapitalanlage	3%	Capital Group	2%
AMF Pension	2%	SEB	2%	Svenska Handelsbanken	2%

Note: Fewer than 5 investors appears if there are no other investors present with more than one percent of shares.

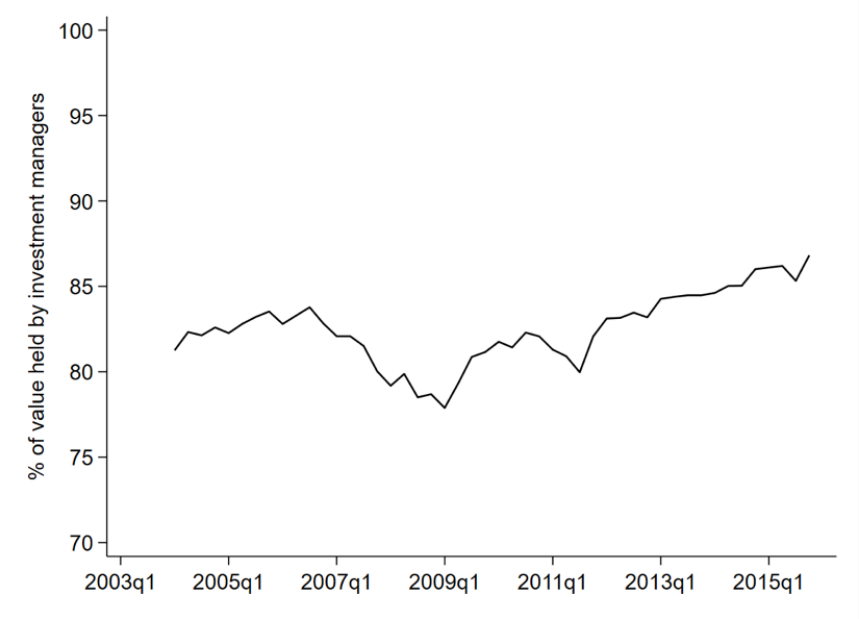
The above-mentioned reasonings and examples illustrate how and where local governments have taken ownership in European banks during the GFC (and have retreated afterwards). However, the ownership patterns also show that often investment managers stay present in large banks (as for example in HSBC and Santander), or that they catch up with governments when these retreat post-GFC (as for example in Lloyds). The reason why this happens is that investment managers such as BlackRock have gained relative importance in general in the US and Europe (mainly due to the increased importance of passive investing), and hence also in the banking sector.

Indeed, the figure below shows the share held by investment managers in the most important US and European companies (S&P 500 and S&P Europe 350).[28] Already in the beginning of our time-period, this share is above 80%. There is a small decline around the crisis, but a quick recovery afterwards and the trends on the whole is upwards. Thus, investment managers' holdings steadily keep rising in European banks, as they increase their overall importance in investor markets and top 25 European banks are part of indices that investment managers buy. Large investment

[28] The S&P Europe 350 and S&P 500 are stock indices operated by S&P Dow Jones and are both part of the S&P Global 1200. They measure the stock performance of large companies listed on stock exchanges in the United States and Europe (comprising the euro zone, Norway, Sweden, Switzerland and the United Kingdom). The index composition between 2004 and 2015 is obtained from Datastream, by taking the composition in the closing month of each quarter. Ownership data, like for our banking sample, comes from the Thomson Reuters Global Ownership database.

managers, such as BlackRock and Vanguard, track these indices and none of the banks in our sample have been removed as a constituent of the S&P indices in that period.

Figure 1: Percentage of total value held by Investment Managers in the S&P 500 and S&P Europe 350 combined[29]



Note: The line indicates the percentage of total non-retail value held by Investment Managers in the S&P 500 and S&P Europe 350 combined.

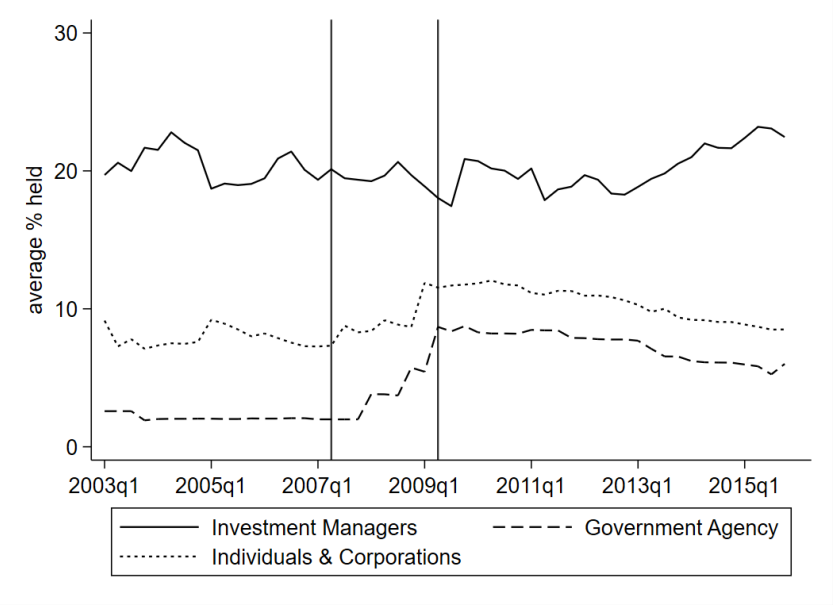
B. General trends

Figure 2 describes the overall percentage of shares of each type of investor (averaged across banks). Investment managers dominate overall, and this is true throughout the sample. They hold an average stake of around 20% per bank but, during the financial crisis, it decreases slightly. More significantly, individuals and corporations and especially government agencies markedly increase their ownership stakes during the crisis.[30] Governments' stakes grew from less than 2% on average to around 9%. Following the financial crisis, the ownership of individuals, corporations and government agencies decrease slowly, whereas investment managers' holdings increase, especially towards the end of the sample.

[29] Figure 1 computes total value by adding up the value held by all investors that hold a minimum of 1% of shares (i.e. the larger or non-retail investors).

[30] Note that the percentages do not add up to 100%, as these are the reported percentage holdings but our sample only includes those investors that hold a minimum of 1%. The not shown investors, therefore, are small investors or "retail investors."

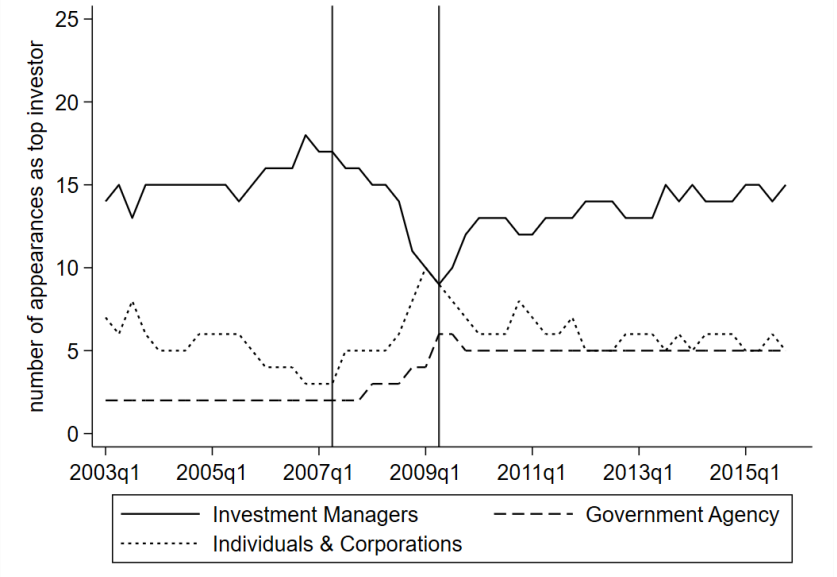
Figure 2. Average holdings of each investor type in the top 25 European banks.



Note: Average percentage of shares held lines indicate the sum of shares over all investors of a certain investor type in a bank, averaged over all banks. The vertical lines represent the beginning and end of the GFC.

We now focus on the top holdings, following up on Table 3, in order to understand what moves "at the top." Figure 3 shows *how many times* each type of investor is the top investor (by percentage held) in the banks of our sample. That is, we count the number of times each type of investor is the #1.[31] Investment managers are, in fact, in the majority of cases, the top investor, and this is true throughout the sample. However, consistent with the results of Figure 2, we see a sharp increase of government agencies and individuals and corporations during the financial crisis. This increase is almost perfectly mirrored by a sharp drop of investment managers as top investors. Thereafter we see a slight decrease of individuals and corporations and government agencies whereas the investment managers rise.

Figure 3. Number of top holdings in top 25 European banks of the top investor, by investor type.

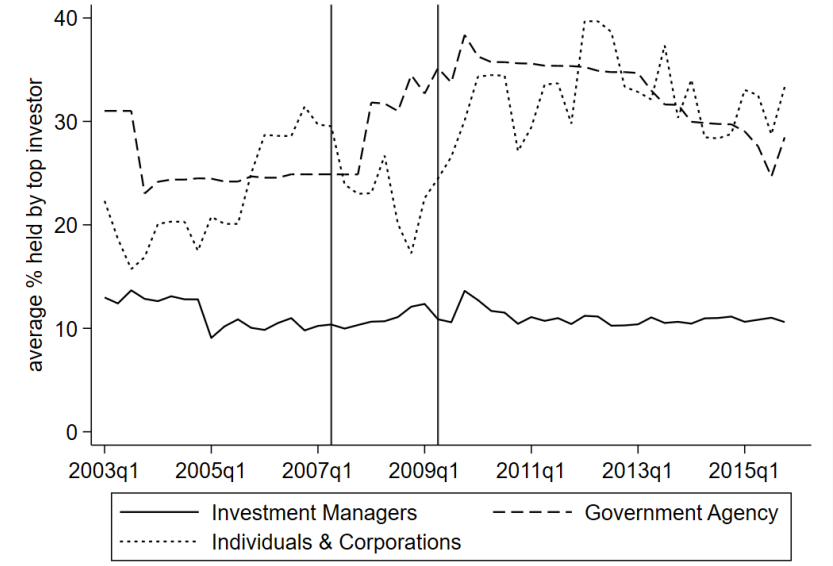


Note: Lines indicate the number of times that an investor of certain type is the top investor in a bank. The vertical lines represent the beginning and end of the GFC.

[31] Note that the sample of banks is of 24 rather than 25 before 2007, as Caixabank appears in our data in 2007.

Figure 4 shows, consistent with the overall pattern of Table 3, that governments, individuals and corporations have, on average (i.e., across all banks), larger holdings than investment managers when they are the top investor. Government agencies' top holdings increase, not only in number, as shown in Figure 3, but also in size, from 25% to 32%, during the financial crisis. This means that government agencies not only become more frequently the largest investor in a bank, but when they are, they also hold larger stakes. The average size of the top holdings of individuals and corporations decreases, mainly due to the large number of them becoming top bank investors, as shown in Figure 3. This pattern, however, is quickly overturned thereafter and average shares of these top investors rise again. Investment managers on average own around 10% per bank when they are top investors, which is not only much lower than the top investor holdings of governments, individuals and corporations, but also it also barely budges around the financial crisis.

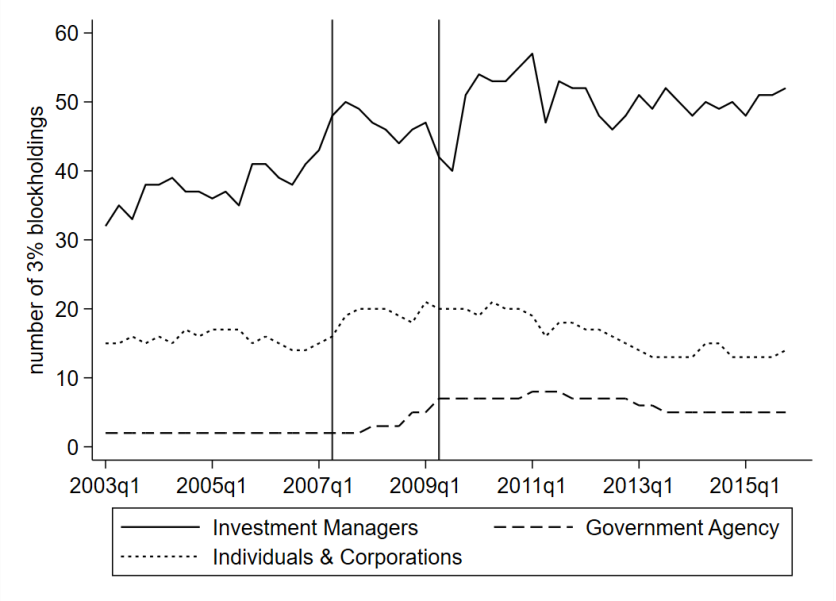
Figure 4. Average holding in top 25 European banks of the top investor, by investor type.



Note: Holding of the largest investor per bank, averaged across investor type. The vertical lines represent the beginning and end of the GFC.

Finally, Figure 5 shows, following up on Table 4, the evolution of the number of 3% blockholdings of each type of investor. The same pattern emerges here again: investment managers dominate, but there is a downward tick during the financial crisis. There is also an upward movement of the number of blocks of the other types although, admittedly, less strong than in the previous graphs.

Figure 5: Number of 3% blockholdings by investor type



Note: At each point in time, the number of holdings with at least 3% of shares are summed across all investors of a certain type. The vertical lines represent the beginning and end of the GFC.

In sum, these patterns show that (i) investment managers dominate in overall percentage holdings, number of blockholdings and in number of top positions, but (ii) when government and individuals/corporations are top shareholder, they have a (much) higher share in a bank than investment managers. Second, during the financial crisis, investment managers stay constant or drop across all of our measures, whereas government agencies and often individuals and corporations rise. But virtually all of these changes are temporary and reverse a few years after the crisis. In the next section we focus on the differences between common and non-common owners rather than on the type of investor.

IV. COMMON OWNERSHIP PATTERNS

Whereas so far we have distinguished by type of investor, we now show the patterns of common ownership – when an investor holds shares in more than one bank – over time. We make use of several measures of common ownership. First, we depict the average ownership stakes of the common investors across pairs of banks. We then construct a measure of ownership based on what we call "sample common owners," which own stakes in at least two banks at least once in our sample. We compare their ownership stakes against those of the non-common owners. Third, and combining the previous two measures, we build common ownership networks. Finally, we use a well-known conceptual measure of common ownership, "lambda", which measures the weights that managers should theoretically place on the other firms if they were to take into account the portfolio of interests of their firm's investors. This measure follows from the objective function proposed by Rotemberg (1984) and O'Brien and Salop (1999), and has since been applied in various empirical studies. [32,33]

Before showing the patterns, it is worth pointing out that the correlation between the percentage held by investment managers and the percentage held by our sample common owners in the top 25 banks is around 0.74 if we take for each bank one quarterly observation, reaching even 0.82 if one collapses observations to the average bank per quarter. In other words, the common investors by and large can be found in the category of investment managers. This is not surprising, as investment managers use diversification, among others, as a tool to reduce portfolio risk.[34]

[32] Rotemberg, J. (1984). Financial transaction costs and industrial performance. Mimeo. O'brien, D. P., & Salop, S. C. (1999). Competitive effects of partial ownership: Financial interest and corporate control. *Antitrust LJ*, 67, 559.

[33] Banal-Estañol, A., Seldeslachts, J., & Vives, X. (2020). Diversification, Common Ownership, and Strategic Incentives. *AEA Papers and Proceedings*, 110, 561-64. Backus, M., Conlon, C., & Sinkinson, M. Common Ownership in America: 1980–2017. *American Economic Journal: Microeconomics*.

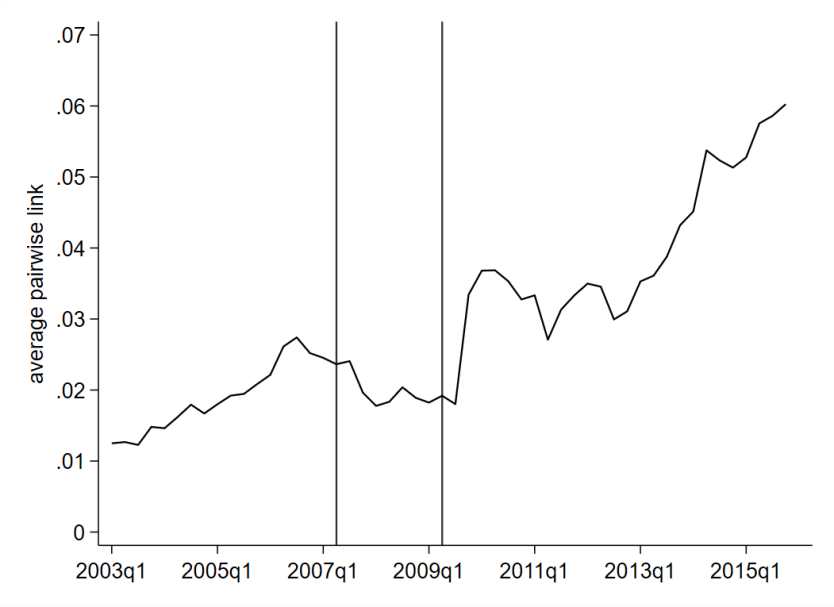
[34] Aggarwal, R. K., & Samwick, A. A. (2003). Why do managers diversify their firms? Agency reconsidered. *The Journal of Finance*, 58(1), 71-118.

A. Bilateral common ownership

We first make use of a "bilateral" measure of common ownership between pairs of banks. We consider a "bilateral common investor" in a pair of banks, at a given point in time, as an investor that holds an ownership stake (of more than 1%) in the two banks. We define the "average interest" of the common investor as the average ownership holdings in the two banks. For example, if an investor owns 5% of one of the banks' equity and 10% of the other, her average interest in the two banks is 7.5%. As another example, if another investor owns 20% of both banks' equity, her average interest is also 20%. We then define the "(bilateral) degree of common ownership" between two banks as the sum of the average interest of all the common investors. Following the previous examples, if the two investors were the only ones with stakes in both banks, their degree of common ownership would be 27.5%. Of course, if an investor has no ownership stake (i.e., less than 1% according to our sample) in one of the banks, her contribution to the degree of common ownership is null.

Figure 6 shows the evolution of the average degree of common ownership across all pairs of banks in our sample.[35] We can see that the average ownership of the common investors rises dramatically throughout the sample period. We can also observe an interruption of such growth during the financial crisis. Still, the growth continues thereafter. Throughout the sample this measure of common ownership increases more than fivefold.

Figure 6. Average degree of common ownership across all pairs of banks over time



Note: The vertical lines represent the beginning and end of the GFC.

B. Common versus non-common ownership

We now compare the influence or control of the common versus the non-common owners. We define here the "sample common investor" as an investor that at least at one period of time in our dataset has an ownership stake (of more than 1%) in at least two banks. We then define the "controlling share" of all the common investors, in a given bank at a given point in time, as the sum of their ownership stakes relative to the ownership stakes of all the investors in our sample. Suppose for instance that, for a given bank, there are six sample common investors with 5% each and one non-common investor with 30%. The remaining 40% belongs to small (retail) investors which hold less than 1% each, and are therefore not in our sample. In that case, the controlling share of the common investors would be 50%. Thus, to look at patterns where owners can exert (some level of) control, we disregard the ownership stakes of the small investors and define the universe of controlling investors as those that have stakes larger than 1%.

[35] Formally, this measure is defined as follows. Consider two banks (j and k) and define as N the set of common investors that own ownership stakes (of at least 1%) in both banks. Given ownership shares α_i^j and α_i^k of common investor $i \in N$ in banks j and k, respectively, her average interest is $c_i^{j,k} = (\alpha_i^j + \alpha_i^k)/2$. The (bilateral) degree of common ownership between banks j and k is $C_{j,k} = \sum_{i \in N} c_i^{j,k}$. The average degree of common ownership is calculated by taking the average of $C_{j,k}$ for each possible unique pair of banks in our sample.

Figure 7 shows the evolution of the average controlling share of the common investors across banks. If the curve is above the 50% line, this means that the common owners have the majority share.[36] As shown by the figure, during the financial crisis the common owners lost their majority, and they only regained it in 2014. This is of course a reflection of what we showed in figure 4, where government agencies and individuals and corporations rise during the financial crisis, and then gradually retreat again.

Figure 7. Percentage of European banks majority-held by common owners.

Note: A bank is majority commonly held if the common investors own more shares than the noncommon investors (retail investors holding <1% of shares are discarded). The graphs indicates the percentage of banks in our sample for which this is the case. The vertical lines represent the beginning and end of the GFC.

C. Networks of common ownership

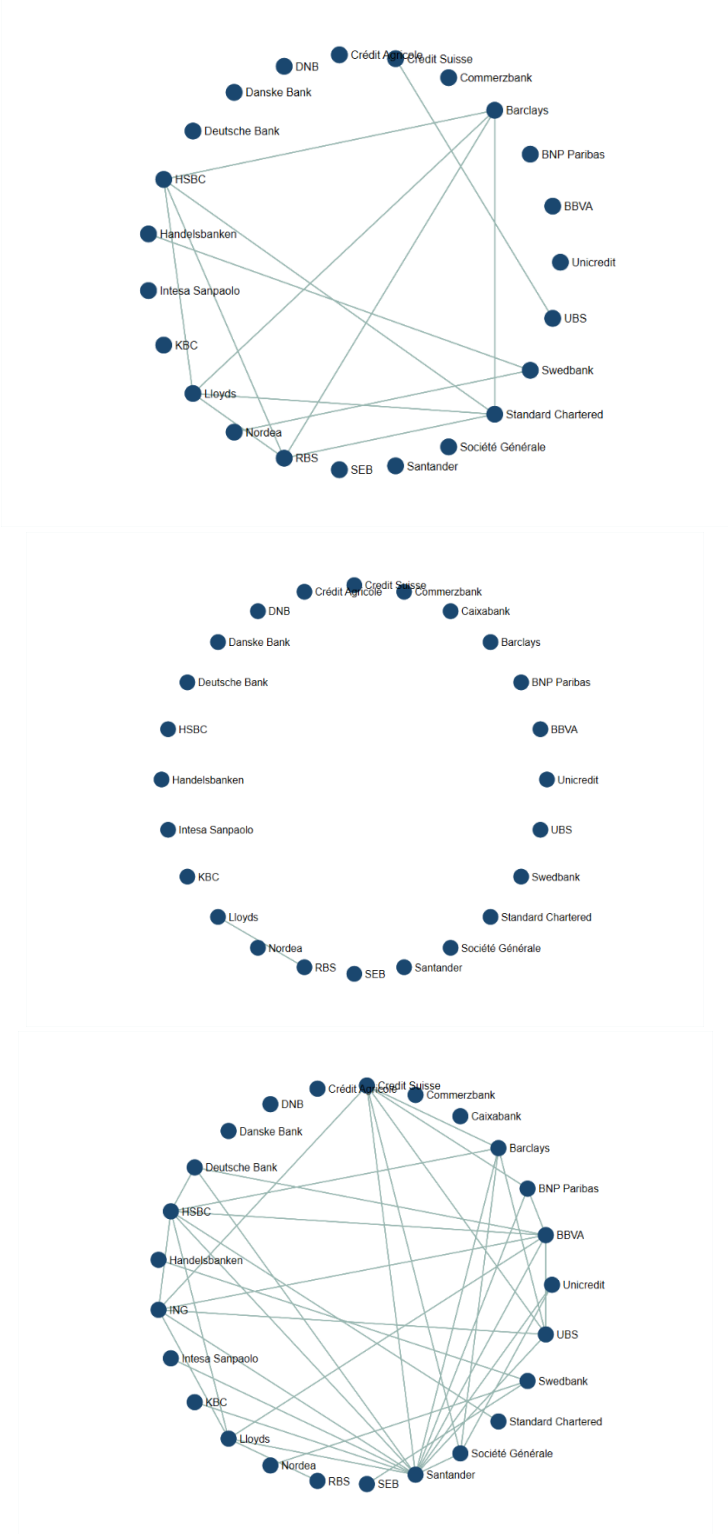
We now combine the previous two measures to construct networks of common ownership.[37] We construct, as our first measure, a "bilateral" measure of common ownership between pairs of banks. We make use of the definition of "bilateral common investors," which is defined as an investor that holds an ownership stake (of more than 1%) in the two banks. We again use the "average interest" of the common investor, i.e., the average ownership holdings in the two banks, and we sum of the average interest of all the common investors. But we compare, as our second measure, the common and non-common owners. We proceed in the same way to compute the average interest of all the non-common investors, taking into account that their ownership stake in one of the banks is null. We consider a given pair of banks linked, through a common ownership link, if the sum of the interests of the common owners in the two banks is larger than that of the non-common owners in our sample.[38]

[36] Formally, this measure is defined as follows. Consider a bank *j* and define as *M* the set of the (sample) common investors (i.e., that own ownership stakes (of at least 1%) in at least two banks in one period of time), and as P the set of other investors in bank *j* in our database (i.e., that own at least 1% in bank *j*). Given the ownership share of any investor *i* in bank *j*, α_i^j, the controlling share of the common investors in bank *j* is defined as $S_j = \sum_{i \in M} \alpha_i^j / \sum_{i \in M \cup P} \alpha_i^j$. The average controlling share of the common investors is calculated by taking the average of S_j for all the banks in our sample.

[37] We build the same common ownership networks as Banal-Estañol, A., Newham, M. and Seldeslachts, J., (2021). Common ownership in the US pharmaceutical industry: A network analysis, *Antitrust Bulletin,* 66(1), 68-99. The measure used here corresponds to the so-called "measure of joint ownership of the common investors."

[38] Formally, this measure is defined as follows. Consider two banks (j and k) and define as N and M the set of common and non-common investors that own ownership stakes (of at least 1%) in the two or one of the two banks, respectively. Given ownership shares α_i^j and α_i^k of a common or a non-common investor $i \in N \cup M$ in banks j and k, respectively, her average interest is $c_i^{j,k} = (\alpha_i^j + \alpha_i^k)/2$. We consider banks j and k linked through a common ownership link if $\sum_{i \in N} c_i^{j,k} > \sum_{i \in M} c_i^{j,k}$.

Figure 8: Networks of common ownership – 2003q1, 2009q3, 2015q4



Note: A link between two banks exists if the common investors (>1% in at least two banks) own, on average, in the two banks, more shares than the non-common investors (>1% in just one bank).

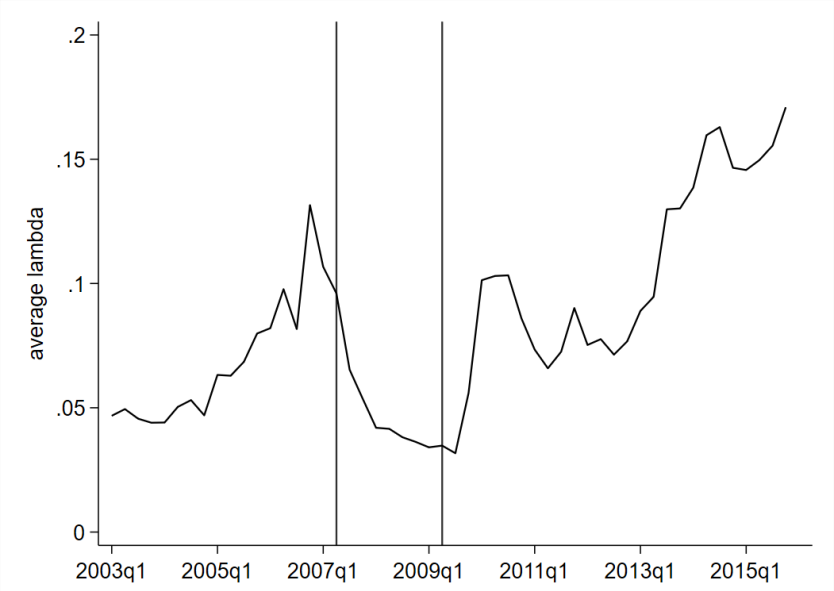
Figure 8 shows the common ownership networks for the same periods of time as our Tables 3 and 4: beginning of the sample, end of the crisis and end of the sample. The pattern that emerges is quite striking. Whereas in 2003Q1 there are some banks that are fairly well connected with other banks (HSBC, RBS, Standard Chartered), in 2009Q *no bank* is connected. On the other hand, in 2015Q4, the network is back in place and much denser than in 2003Q1.

D. A common ownership incentive measure ("lambda")

We now make use of the well-known common ownership incentive measure, or "lambda." This bilateral measure of common ownership is defined as follows. For each bank, we take the weight that the manager of this bank should place on each of the other banks, relative to the weight the bank places to its own profits, in its objective function. An underlying assumption is that each bank maximizes a weighted average of its shareholders' portfolio profits and the resulting weights $\lambda_{j,k}$ indicate how much bank j values 1 euro of profits in bank k. The measure captures both the ability and incentives by taking into account the ownership concentration of firm j.[39] Ceteris paribus, a bank with more concentrated investors will place more weight on its own profits and less on the other banks' profits as its control rights will be relatively expensive.

Figure 9 shows the average of the (pairwise) lambdas over time, where the average is computed across all pairs of banks in our sample.[40] The movements for lambda are similar as in Figure 6, but much more pronounced. In particular, the downturn during the crisis goes from lambda being more than 0.1 at the end of 2006 (before the crisis starts) to lambda being less than 0.04 (right after the crisis). However, by the end of our sample, lambda has fully recovered and is now higher than at its pre-crisis peak.

Figure 9. Average lambdas across pairs of banks over time.



Note: We construct the common ownership measure "lambda" for each ordered pair of banks and compute the average. The vertical lines represent the beginning and end of the GFC.

V. A brief comparison with the US

This section showcases the striking differences between the (common) ownership patterns of the US banks, as compared to the European ones, both in levels as well as over time. First, Figure 10 shows that virtually all investors in top US banks are investment managers, and that there has been no change whatsoever over the sample whole period. This is in stark contrast with the same figure for European banks, Figure 2, which shows that investment managers hold a constant share of around 20%, while individuals, corporations and governments increase their share during the crisis.

[39] Banal-Estañol, A., Seldeslachts, J., & Vives, X. (2020). Diversification, Common Ownership, and Strategic Incentives. *AEA Papers and Proceedings*, 110, 561-64. Backus, M., Conlon, C., & Sinkinson, M. (2020). Common Ownership in America: 1980–2017. *American Economic Journal: Microeconomics*.

[40] Formally, this measure is defined as follows. Consider two banks (j and k) and define as the ownership shares α_i^j and α_i^k of any investor i in banks j and k, respectively. $(\alpha_i^j + \alpha_i^k)/2$. Assuming proportional control, the (bilateral) lambda between bank j and k is $\lambda_{j,k} = \sum_i \alpha_i^j \alpha_i^k / \sum_i (\alpha_i^j)^2$. The average lambda is calculated by taking the average of $\lambda_{j,k}$ for each possible ordered pair of banks in our sample.

Figure 10. Average fraction of US banks held by investor type.

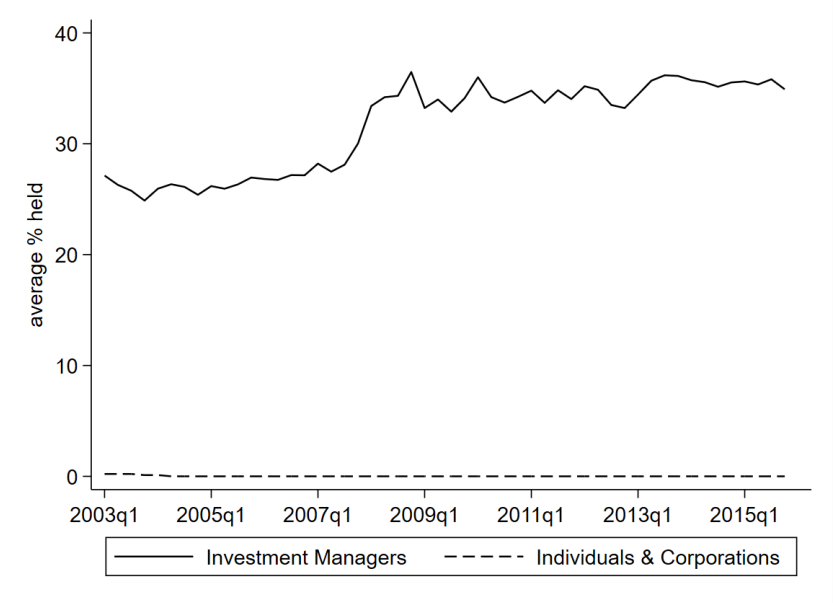


Figure 11 depicts the "bilateral" measure of common ownership between pairs of US banks, and compares it with the levels and evolution of the European counterpart (depicted in Figure 5, but also reprinted in Figure 11 in a dashed line). We note first a substantial difference in levels, as the US measure ranges from 0.15 at the beginning of the sample to 0.25 at its peak end 2008, whereas its European counterpart reaches its maximum of 0.06 at the end of the sample. Furthermore, we do not observe a growth interruption during the financial crisis, as we do in Europe, but instead a sharp increase in the measure for the US banks.

Figure 11. Average degree of common ownership across all pairs of US/European banks over time

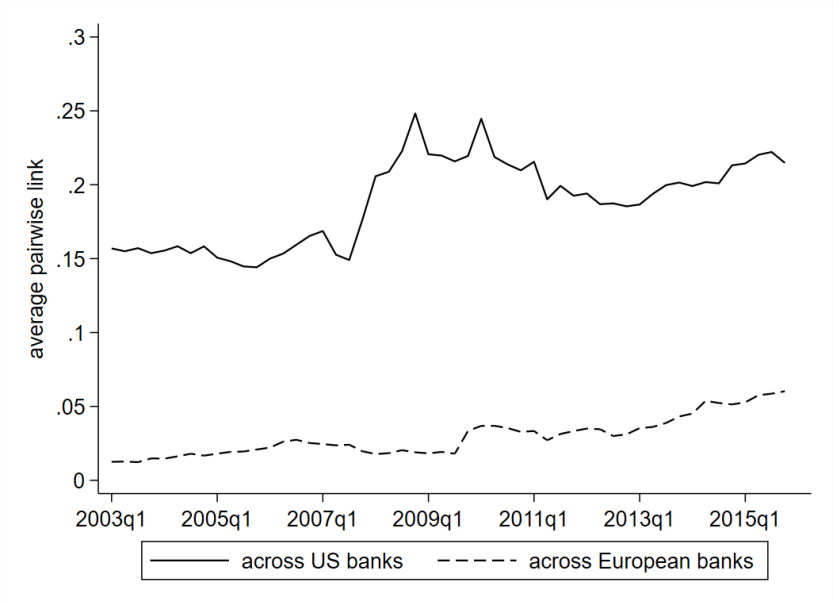
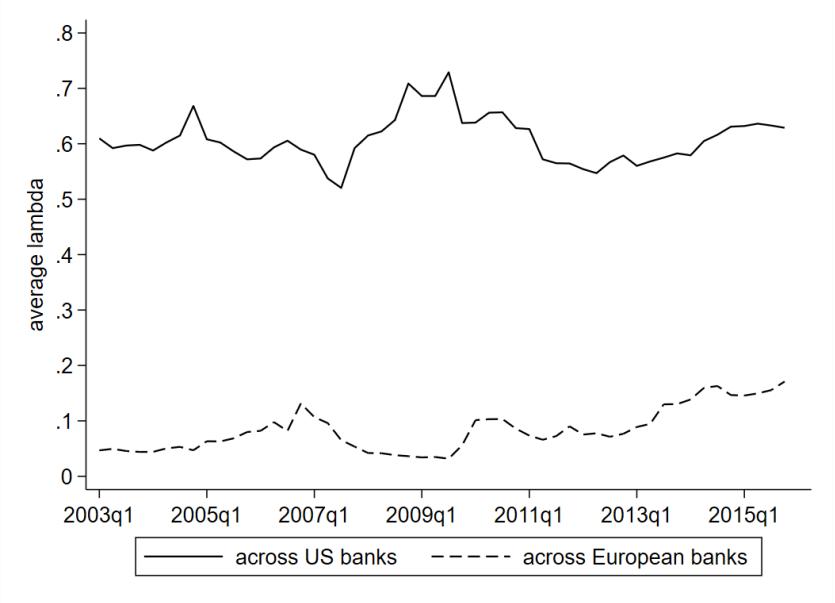


Figure 12 shows the conceptual measure of common ownership between pairs of US banks, and compares it with the levels and evolution of the European counterpart depicted in Figure 9 (also reprinted in Figure 12 in a dashed line). As in the case of the bilateral measure, we observe a substantial difference in levels, as the US measure is around 0.6 throughout the sample whereas its European counterpart does not reach 0.2 in any point of the sample. Moreover, the measure for the US is quite stable whereas the measure for Europe increases substantially over time perentage-wise, only with a growth interruption during the financial crisis.

Figure 12. Average lambda over time.



VI. IMPLICATIONS

The ownership and common ownership patterns in the banking sector may have important consequences for bank competition, bank value and financial stability. We discuss them in turn.

A. Competition effects of common financial interests in competitors

The increasing levels of common ownership among the largest European banks, which have only been temporarily interrupted during the GFC, can have consequences for bank competition. Commonly owned banks might have less incentives to unilaterally compete, due to various mechanisms.[41,42,43] First, banks that are largely owned by shareholders who also have sizable stakes in competitors might just simply act in these shareholders' interest, which leads them to soften competition.[44] Note that, while there is evidence that investment managers engage in active discussions with management, they do not need to actively intervene to have an impact on decision-making. They may apply "selective omission" by encouraging actions that increase portfolio profits and remaining silent when this is not the case.[45]

There is some evidence on the effects of common ownership, and more generally of the minority financial interests on competitors specifically for the banking industry. Defining deposits as a "product" to identify the market, Azar et al. (2019) show that common and cross ownership are correlated with deposit rates.[46] Barone et al. (2020) exploit a quasi-experimental change in Italian legislation forbidding interlocking directorates between banks, which is arguably a channel that leads to similar effects as common ownership, i.e., it connects banks.[47] They find that the reform decreased rates charged by previously interlocked banks by 10-30 basis points.

Provided that common ownership may reduce competition, our results suggest that the European banking sector may be becoming less competitive over time. Government intervention during the GFC, and especially the capital

[41] Previous research in the airline industry has pointed toward a positive relationship between common ownership and prices. See Azar, J., Schmalz, M. C., & Tecu, I. (2018). Anticompetitive effects of common ownership. *The Journal of Finance*, 73(4), 1513-1565.

[42] For an overview of the mechanisms by which large horizontal shareholdings are likely to influence corporate management, see Elhauge, E. (2021). The Causal Mechanisms of Horizontal Shareholding. *Ohio State Law Journal*, 82(2).

[43] Indeed, as O'Brien and Salop (2000) note, the anticompetitive effects of common ownership are similar to that of cross ownership in that common ownership can be understood to be ownership in one firm, coupled with cross ownership in the others. O'Brien, D. P., & Salop, S. C. (1999). Competitive effects of partial ownership: Financial interest and corporate control. *Antitrust Law Journal,* 67, 559.

[44] Azar, J. (2017). Portfolio diversification, market power, and the theory of the firm. Mimeo.

[45] Further, they may design payment schemes for the top management to shape their incentives in a way that leads to softer product market competition. Anton, Ederer, Gine, and Schmalz (2020) find that higher firm-level common ownership is linked to less performance-sensitive incentives for CEOs and other top managers, which in turn may lead to softer competition. Antón, M., Ederer, F., Giné, M., & Schmalz, M. C. (2020). Common ownership, competition, and top management incentives. Mimeo.

[46] Azar, J., Raina, S., & Schmalz, M. C. (2019). Ultimate ownership and bank competition. Mimeo.

[47] Barone, G., Schivardi, F., & Sette, E. (2020). Interlocking Directorates and Competition in Banking. Mimeo.

injections to prop up the banks, may have generated as a side effect a large but temporary push in the other direction, towards more competition in the banking sector. Still, the interplay between common and large non-common owners, such as governments and to a lesser extent individuals and corporations, in the European banking sector, especially in comparison to the US banking sector, may have differential effects on competition. Non-common owners should not be willing to sacrifice individual profits at the expense of raising the profits of competing banks.

While managers of commonly owned banks may unilaterally engage in anticompetitive behavior, common ownership might also induce coordinated action (Rock and Rubinfeld, 2020).[48] Economic theory predicts that communication can facilitate both coordination and monitoring defection from a common strategy.[49] While many forms of private communication are illegal, public information disclosure could serve as an alternative coordinating and monitoring mechanism to achieve tacit collusion, as suggested by, for example, the Organization for Economic Cooperation and Development.[50] Indeed, Pawliczek et al. (2019) find that higher horizontal shareholding levels increase firm disclosures of information that can help them to coordinate.[51] Note that coordinated action may, as opposed to individual action, find less opposition from non-common owners, as it should also boost individual profits.

B. Ownership concentration and bank valuation

An extensive body of corporate governance research has analyzed the impact of (large) blockholder ownership on firm value and other performance measures (Short, 1994).[52] But it is still unclear whether the presence of large blockholders, who may lessen or exacerbate agency problems (Shleifer and Vishny, 1997), does, in fact, improve company performance (Holderness, 2003).[53] In the banking sector, Caprio et al. (2007) show that ownership concentration increases bank valuation.[54] This is consistent with the idea that concentrated ownership may reduce incentives for insiders to expropriate bank resources, and that this boosts valuations. Still, large blockholder ownership may have negative effects in Europe. Thomsen et al. (2006) find firm blockholdings to be associated with lower subsequent firm value in Europe, because the size of the blockholdings are too high from a minority shareholder value viewpoint.

Taking into account the ownership patterns described in the paper, these would suggest that bank valuations may have increased over time, as the size and the number of blockholdings have increased. But there may also be a countervailing effect, which would suggest that valuations may have decreased, because the size of the holdings of the top shareholders in the European banks is large, especially during the GFC.

C. The role of one large non-common investor versus a coalition of common investors

There is to the best of our knowledge no published research that has investigated how a coalition of common investors versus one large non-common investor has an impact on competition and valuation.[55] However, in terms of corporate governance, there is a stream of literature that looks at how blockholders in a firm interact, and how this interaction affects performance.

Theory suggests that the benefit of becoming a blockholder in a firm will depend on other blockholders' presence. On the one hand, Winton (1993) shows that there are negative externalities between blockholders due to inefficiencies arising from free-rider problems, while Zwiebel's (1995) model explains how the presence of a large investor dissuades others from placing or keeping a block position in the firm due to the allocation of private benefits of control.[56] On the other hand, several studies indicate potential positive externalities; Edmans and Manso (2011), for example, show how multiple blockholders can generate positive externalities, as they impose a stronger threat of discipline that induces higher managerial effort.[57]

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[48] Rock, E. B., & Rubinfeld, D. L. (2020). Common Ownership and Coordinated Effects. *Antitrust Law Journal*, 83, 201.

[49] See Levenstein, M. C., & Suslow, V. Y. (2006). What determines cartel success?. *Journal of Economic Literature*, 44(1), 43-95 and Stigler, G. J. (1964). A theory of oligopoly. *Journal of Political Economy*, 72(1), 44-61.

[50] Organization for Economic Cooperation and Development, 2012. Unilateral disclosure of information with anticompetitive effects, http://www.oecd.org/daf/competition/Unilateraldisclosureofinformation2012.pdf.

[51] Pawliczek, A., Skinner, A. N., & Zechman, S. L. (2019). Facilitating tacit collusion: a new perspective on common ownership and voluntary disclosure. Mimeo.

[52] Short, H.. (1994). Ownership, control, financial structure and the performance of firms. *Journal of Economic Surveys*, 8(3), 203– 249.

[53] Shleifer, A., Vishny, R.W. (1997). A survey of corporate governance. *Journal of Finance*, 52(2), 737– 783. Holderness, C., (2003). A survey of blockholders and corporate control. *Economic Policy Review*, 9(1), 51– 63.

[54] Caprio, G., Laeven, L., & Levine, R. (2007). Governance and bank valuation. *Journal of Financial Intermediation*, 16(4), 584-617.

[55] However, we are currently working on an empirical project that investigates the impact of ownership patterns in European firms, where preliminary findings indicate that when a large non-common owner coincides with a coalition of common owners (as is the case in several of our banks), this has a negative impact on performance.

[56] Winton, A. (1993). Limitation of liability and the ownership structure of the firm. *The Journal of Finance,* 48(2), 487-512. Zwiebel, J. (1995). Block investment and partial benefits of corporate control. *The Review of Economic Studies*, 62(2), 161-185.

[57] Edmans, A., and G. Manso. (2011). Governance through trading and intervention: A theory of multiple blockholders. *Review of Financial Studies*, 24, 2395–2428.

Using a sample of listed US firms, Hadlock and Schwartz-Ziv (2019) empirically study the decision to establish or maintain a block position.[58] Except for small blocks of investment managers, they find evidence of a negative influence of the presence of an incumbent blockholder on the decision of others to establish or maintain a block position in a firm. They further find that non-financial blockholders tend to hold on to their positions for longer and are much less likely to invest in a large number of firms, which in our context makes them more likely to be a (large) non-common owner. While the studies mentioned above focus on individual blockholders' actions, there is also recent empirical evidence indicating that coordinated actions of investment managers can strengthen governance via voice, but weaken governance via threat of exit.[59]

Looking specifically at European markets, Thomson et al. (2005) find a negative association between large investors' presence and returns in the next period for firms with high initial levels of blockholder ownership.[60] They interpret their findings as conflicts of interest between large and small investors. For the European banking industry, several empirical studies find evidence of a link between different investor types' presence and performance. Iannotta et al. (2007) find that government-owned banks exhibit lower profitability than private banks and that mutual banks have better loan quality and lower asset risk than both private and government-owned banks.[61] Barry et al. (2011) categorize investors and show that institutional investors and non-financial companies impose the riskiest strategies when holding higher stakes, while for publicly held banks changes in ownership structure do not affect risk taking.[62]

D. Common and non-common ownership and financial stability

Common ownership creates networks of financial institutions. Financial institutions are already widely recognized to be interconnected in various ways (Jackson and Pernoud, 2020).[63] First, they are linked through financial contracts, as they lend to and borrow from each other, invest together, and repackage and resell assets to each other (see e.g., Allen and Gale, 2000).[64] Second, their values are correlated because they are exposed to the same shocks (Acharya and Yorulmazer, 2007).[65]

Because of these connections, financial networks are "robust-yet-fragile" (Gai and Kapadia, 2010, Jackson and Pernoud, 2020).[66] Indeed, links between banks, in the form of lending or liquidity provision, may make individual institutions more resilient to liquidity shocks. Indeed, networks allow for risk-sharing, spreading shocks among counterparties, and diminish the probability of individual failure. But large shocks may still cause an institution to fail, and then the links can transmit the shock more widely and cause other institutions to fail (Acemoglu et al. 2015).[67]

Common ownership between banks is yet another channel through which financial institutions are interconnected. As such, the increase in common ownership documented in our analysis suggest a positive effect on the resilience of the individual banks and the stability of the entire financial system. Common, as compared to non-common, owners may be more willing to help an individual bank suffering a negative shock, if the bank's financial problems have a knock-on negative effect on other banks. Government ownership, on the other hand, may also inject capital and thus also stabilize a bank, but for entirely different reasons.[68] Thus, there may have been a certain substitution between the common owners and the government non-common owners as those providing stability in the European banking sector.

Common ownership may also indirectly affect stability through competition. The relationship, though, may be ambiguous. Not only the effect of common ownership on competition is controversial, but there is also a potential trade-

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[58] Hadlock, C., & Schwartz-Ziv, M. (2019). Blockholder heterogeneity, multiple blocks, and the dance between blockholders. *The Review of Financial Studies*, 32(11), 4196-4227.

[59] Matvos, G., & Ostrovsky, M. (2010). Heterogeneity and peer effects in mutual fund proxy voting. *Journal of Financial Economics*, *98*(1), 90-112. Crane, A. D., Koch, A., & Michenaud, S. (2019). Institutional investor cliques and governance. *Journal of Financial Economics*, *133*(1), 175-197.

[60] Thomsen, S., Pedersen, T., & Kvist, H. K. (2006). Blockholder ownership: Effects on firm value in market and control based governance systems. *Journal of Corporate Finance*, 12(2), 246-269.

[61] Iannotta, G., Nocera, G., & Sironi, A. (2007). Ownership structure, risk and performance in the European banking industry. *Journal of Banking & Finance*, 31(7), 2127-2149

[62] Barry, T. A., Lepetit, L., & Tarazi, A. (2011). Ownership structure and risk in publicly held and privately owned banks. *Journal of Banking & Finance*, 35(5), 1327-1340.

[63] Jackson, M. O., & Pernoud, A. (2020). Systemic risk in financial networks: A survey. Mimeo.

[64] Allen, F., & Gale, D. (2004). Competition and financial stability. *Journal of Money, Credit and Banking*, 453-480.

[65] Acharya, V. V., & Yorulmazer, T. (2007). Too many to fail—An analysis of time-inconsistency in bank closure policies. *Journal of Financial Intermediation*, 16(1), 1-31.

[66] Gai, P., & Kapadia, S. (2010). Contagion in financial networks. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 466(2120), 2401-2423. Jackson, M. O., & Pernoud, A. (2020). Systemic Risk in Financial Networks: A Survey. Mimeo.

[67] Acemoglu, D., Ozdaglar, A., & Tahbaz-Salehi, A. (2015). Systemic risk and stability in financial networks. *American Economic Review*, 105(2), 564-608.

[68] Fiordelisi et al. (2015) analyzes the effect of state-aid on competition as well as bank stability. They show that capital injections, guarantees and asset relief measures increase individual bank soundness. Fiordelisi, F., Mare, D. S., & Molyneux, P. (2015). State-aid, stability and competition in European banking. Mimeo.

off between competition and stability (Allen and Gale, 2004; Vives, 2010).[69] On the one hand, the "competition-fragility" view argues that more competition erodes market power, reducing profit margins and franchise values. This in turn encourages banks to take on extra risk, thus decreasing stability. On the other hand, the "competition-stability" view explains that a higher market power in the loan market may result in greater bank risk as the higher interest rates charged to loan customers make it more difficult to repay loans and exacerbate moral hazard and adverse selection problems.[70]

VII. CONCLUSION

This paper documents the 2007–2009 financial crisis' impact on ownership and common ownership patterns in the largest European banks. Several banks witnessed a large capital inflow from local investors, mainly governments. Since these investors typically hold equity in only one bank, this has led non-common owners to hold the majority share in the large European banks, on average, vis-à-vis the coalition of common owners (typically investment managers). However, common shareholders are back as a majority a few years after the crisis, and continue to form ever tighter-knit networks of common ownership holdings in European banks.

While outside the scope of the current study, further work is needed to investigate what the impact is of common ownership networks on the functioning of the European banking sector, and this in terms of competition, performance, stability and risk propagation. Furthermore, the interaction of one large-stake non-common investor versus a coalition of smaller-stake common investors warrants further investigation, not only in the European banking sector but more in general in European markets, as the comparison of European and US banks hints that European industries might show different questions of control with regards to common ownership.

Finally, the current coronavirus pandemic may again have severe consequences for the banking industry (Tan et al., 2020).[71] Banks should now be better prepared than at the time of the GFC, in large partly thanks to the regulatory reforms that followed the GFC. But banks may still experience significant capital shortfalls, as result of, for instance, a sharp increase in the number of business failures and non-performing loans (Gourinchas et al., 2020).[72] Hence, and despite of the post-GFC regulatory efforts, we may again witness government interventions to prevent distress and contain the economic costs of the pandemic (Dell'Ariccia et al. 2018).[73] Some of these government interventions may again affect the ownership structure of the banking sector, and consequently competition therein.

[69] Allen, F., & Gale, D. (2004). Competition and financial stability. *Journal of Money, Credit and Banking*, 453-480. Vives, X. (2010). Competition and stability in banking. Mimeo.

[70] The empirical evidence on the link between competition and stability is also and largely dependent on the sample, estimation methodology and choice of conditioning variables used (Beck et al., 2013). Beck, T., De Jonghe, O., & Schepens, G. (2013). Bank competition and stability: Cross-country heterogeneity. *Journal of Financial Intermediation*, 22(2), 218-244.

[71] Government Intervention and Bank Market Power: Lessons from the Global Financial Crisis for the COVID-19 Crisis Author/Editor:Brandon Tan ; Maria Soledad Martinez Peria ; Nicola Pierri ; Andrea F Presbitero

[72] Gourinchas, P. O., Kalemli-Özcan, Ş., Penciakova, V., & Sander, N. (2020). Covid-19 and SME failures. National Bureau of Economic Research.

[73] Dell'Ariccia, G., Peria, M. S. M., Igan, D., Awadzi, E. A., Dobler, M., & Sandri, D. (2018). Trade-offs in Bank Resolution. International Monetary Fund.

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