The Effect of Common Ownership on Profits: Evidence From the U.S. Banking Industry

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May 20, 2018

Abstract

Theory predicts that common ownership can be anticompetitive, because it reduces the weight firms place in their objective function on their own profits and instead shifts weight on rival firms that are held by a common shareholder. In this paper we use accounting data from the banking industry to examine empirically whether shifts in the profit weights are associated with shifts in profits. We present the distribution of a wide range of estimates that vary the specification, sample restrictions, and assumptions used to calculate the profit weights. The distribution of estimates is roughly centered around zero, but we find statistically significant estimates in either direction in some cases. Economically, most estimates are fairly small. Our interpretation of these findings is that there is little evidence for economically important effects of common ownership on profits in the banking industry.

Very Preliminary. Do not cite. Comments Very Welcome.

JEL Codes: L40, L20, L10, G34, G21

Keywords: Common Ownership, Competition, Profits, Banking

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The analysis and conclusions set forth are those of the authors and do not indicate concurrence by other members of the staff, by the Board of Governors, or by the Federal Reserve Banks. Rebecca Jorgensen, Nadia Wallace, Meher Islam, and Helen Willis provided outstanding research assistance.

1 Introduction

Several recent empirical papers have estimated the competitive effects of common ownership. Azar, Schmalz, and Tecu (2016) find that common ownership increases prices in the airline industry by relating prices to concentration measures that account for common ownership. Azar, Raina, and Schmalz (2016) report similar findings for the banking industry. Gramlich and Grundl (2017) use an alternative methodology to estimating the competitive effects and in preliminary estimates find mixed signs and economically fairly small effects for both prices and quantities in the banking industry. Kennedy, O'Brien, Song, and Waehrer (2017) present similar estimates for the airline industry and preliminary estimates from a structural model and conclude that there is no evidence of anticompetitive effects.[1] Dennis, Gerardi, and Schenone (2017) use a similar methodology as Azar, Schmalz, and Tecu (2016), and also conclude that there is no effect of common ownership on prices in the airline industry.[2][3]

The model underlying these papers (O'Brien and Salop (2000)) predicts anticompetitive effects of common ownership as follows: If managers maximize the payoffs of their shareholders then they maximize a weighted sum of their own profits and of the profits of their rivals that are held by a common shareholder. Hence, common ownership reduces the weight firms place in their objective function on their own profits and instead shifts weight on commonly held rival firms. This reduces competition among firms and therefore increases prices and reduces quantities. Thus, theory predicts anticompetitive effects of common ownership due to shifts in profit weights.

The empirical literature has so far mostly focused on the effects on prices, and to a

[1] See Azar, Schmalz, and Tecu (2017) for a reply to this paper.

[2] This conclusion has been challenged by Martin Schmalz, arguing that Dennis, Gerardi, and Schenone (2017) actually report anticompetitive effects of common ownership for large routes.

[3] The findings of anticompetitive effects of common ownership have received a lot of attention from economists, legal scholars, competition authorities, policy makers and representatives of the asset management industry. These findings also led to some far reaching policy proposals. Posner, Scott Morton, and Weyl (2016) propose to limit the anti-competitive power of institutional investors by limiting their holdings in an industry to 1% or alternatively to only hold shares of a single firm in the industry. Elhauge (2016) recommends antitrust enforcement actions to reduce common ownership in instances where it can be shown to have anticompetitive effects. Rock and Rubinfeld (2017) challenge the legal analysis by Elhauge (2016) discuss the proposals by Posner, Scott Morton, and Weyl (2016). The OECD held a discussion on the issue with economists, legal scholars and representatives of the asset management industry. Scott Morton and Hovenkamp (2017) discuss how current antitrust law applies to the common ownership issue. Moreover, the Department of Justice in the U.S. has investigated the issue. In addition to the implications for antitrust and the regulation of the asset management industry, some have pointed out links to the ongoing debates about rising profit shares and wealth inequality.

lesser extent on quantities. In this paper we estimate the effect of common ownership on profits. Specifically, we investigate whether the shifts in the profit weights within an industry due to common ownership, that are predicted by the theory, are associated with shifts in profits.

Related Work Our paper is most closely related to Azar (2011) and Panayides and Thomas (2017), which are cross-industry studies on the effect of common ownership on profits. Azar (2011) finds that common ownership is associated with higher markups. Panayides and Thomas (2017) find that common ownership is associated with increased profitability, but not with higher output prices and conclude that the effect is driven by reduced expenditures. Moreover they find that reduced expenditures are not driven by reduced input prices but by lowered investment, which suggests lowered non-price competition.

In this paper we take a different approach than Azar (2011) and Panayides and Thomas (2017) by studying the effect of common ownership on profits within an industry rather than across industries. We argue that such a within-industry approach is particularly useful in industries such as banking where a large number of competitors are not publicly traded and therefore have low levels of common ownership and experienced no increase in common ownership. These privately owned firms serve therefore as a useful control group for the publicly traded firms that have high levels of common ownership and experienced large increases of common ownership in the previous decades. We study whether the shift in profit weights among publicly traded firms was associated with shifts in industry profits.

In banking, the model-implied weight on own profits among publicly traded firms is typically far below 10% and was more than twice as high in the year 2001 than in the year 2016. The model-implied weight on profits among private banks however is typically 100% and has not declined since 2001. Loosely speaking, we ask whether the shift in profit weights among publicly listed banks decreased their share of industry profits at the expense of private banks. We also study whether within the group of listed banks profits shifted from banks with less weight on their own profits to banks with higher weight on their own profits.

Why Banking? We estimate the effect of common ownership on profits in the banking industry. One advantage of choosing the banking industry is that it is one of the two industries for which anticompetitive effects of common ownership have been reported

(Azar, Raina, and Schmalz (2016)). Moreover, there is a large number of publicly listed banks, which generates a lot of variation in common ownership. There are more than 400 publicly listed banks in the U.S., which is much more than for example the number of publicly listed airlines. In addition there is an even larger number of banks that is not publicly traded, and therefore did not experience an increase of common ownership through large institutional investors, which serves as a useful control group. Perhaps most importantly, standardized accounting data is available not only for publicly listed banks but also for private banks. Bank regulators restrict how banks report their income statements and balance sheets, which makes the data comparable across banks. In many other industries private companies either play no important role or accounting data is either not available or difficult to compare across firms.

There are also disadvantages of studying this question in the banking industry. Perhaps most importantly, the financial crisis and subsequent regulatory changes had large effects on bank profits that are unrelated to the competitive effects of common ownership. We try to side-step this problem in some of our estimates by restricting the sample period to either the pre-crisis or the post-crisis years.

Data We use accounting data from regulatory filings to measure bank profits. Economists in general and IO economists in particular distrust data on accounting profits because they can differ from economic profits. We believe that studying data on accounting profits is still informative in this case even if accounting profits differ from economic profits. For our purposes it is not crucially important that accounting profits equal economic profits but that accounting profits co-move with economic profits so that changes of accounting profits within bank over time are informative about changes of economic profits over time. We even believe that accounting profits are fairly comparable across banks because banks are highly restricted by bank regulators in how they report income statements and balance sheets.[4]

Our data set covers the more than 6,000 banks in the U.S. each quarter from 2001 to 2016, which results in approximately 400,000 bank-quarter observations.

Specifications, Sample Restrictions and Variable Definitions As is commonly the case in empirical research there are many plausible specifications, sample restrictions and variables definitions. In this paper we do not follow the common approach, which is

[4]Notice also that the payouts of shareholders, especially the common owners, are restricted by regulators, partly based on accounting measures.

to present findings for a "baseline case", i.e. a particular specification, sample restriction and variable definition, and perhaps several robustness checks. Instead, we obtained several hundred estimates for different specifications, sample restrictions and different ways to calculate the profit weights and report the distribution of these estimates. We also discuss how the distribution of estimates varies by specification, sample restriction or profit weight definition. This approach allows the reader to get a more complete picture of the range of plausible estimates. In the main text of this paper we present the distribution of estimates, but in the Online Appendix we show each estimate we obtained. This allows the readers to look up particular estimates they are interested in.

We believe that this approach is particularly useful for this paper because different researchers have arrived at different conclusions regarding the competitive effects of common ownership even if they have used similar methodologies and data sets. We also hope that similar approaches to presenting empirical results become more common in economics in general.

We estimate the effect of the weight a bank places on its own profits on three dependent variables: net income, return on equity (ROE) and return on assets (ROA). For each of these three variables we also consider a transformation of the variable into percentiles by quarter. For example the bank with the highest ROE in some quarter has ROE percentile 100 and the bank with the lowest ROE has percentile 0. This transformation makes magnitudes of estimates for the three outcome variables more easily comparable and reduces the effect of "outliers", especially during the financial crisis. We consider six different specifications that vary the fixed effects and observable characteristics we control for, twelve different sample choices, that vary the time period and the set of banks that are included, and lastly four different ways to calculate the profit weights. This results in $6 * 12 * 4 = 288$ estimates for each of the six outcome variables.

Preliminary Findings We now turn to a discussion of our main findings. We focus the discussion here on the estimates of the percentile transformation of the outcome variables. The distribution of point estimates for the effects of the weight on own profits on net income, ROE and ROA are roughly centered around zero. The estimated effect of a 1 pp increase in the weight on own profits ranges from -0.47 pp to +0.27 pp, with a median of -0.03 pp for net income, from -0.44 pp to +0.49 pp, with a median of -0.002 pp for ROE, and from -0.41 pp to +0.41 pp with a median of -0.009 pp for ROA. Some

of the estimates that are large in magnitude are imprecise. Therefore, the range of estimates shrinks considerably if we focus on estimates that are statistically significant at the one percent level.[5] In this case the estimates range from -0.47 pp to +0.09 pp, with a median of -0.09 pp for net income, from -0.44 pp to +0.08 pp, with a median of -0.04 pp for ROE, and from -0.41 pp to +0.15 pp with a median of -0.03 pp for ROA. We also show how the distribution of estimates varies by specification, sample and profit weight calculation.

In our view, the magnitude of the positive and statistically significant estimates is relatively small. For example, between 2001 and 2016 the average weight placed on own profits by listed banks has fallen by roughly 5 pp due to an increase in common ownership. Even the largest statistically significant estimates we find imply that a 5 pp decrease in weight on own profits is associated with a shift in the net income distribution by 0.45 pp, a shift in the ROE distribution of 0.4 pp and a shift in the ROA distribution by 0.75 pp.

Direct Shareholders and Active Investors We also obtain some preliminary estimates that only rely on common ownership through either "Direct Shareholders" or through "Active Investors".

"Direct Shareholders" are the ultimate owners of the shares as opposed to asset managers that manage shares that are ultimately owned by their clients. For example Berkshire Hathaway is a large "Direct Shareholder" of several banks, whereas Vanguard for Fidelity are large shareholders of banks but not a "Direct Shareholder". The idea is that "Direct Shareholders" benefit more from increasing share prices (as a consequence of decreased competition) than asset managers that typically earn a fixed small percentage of assets under management.

"Active Investors" are defined as those investors that do not simply replicate an index. The idea is that index funds compete mostly on fees. It is unclear how strong the incentives of an index fund manager are to reduce competition among portfolio firms, given that improved performance of the index would also improve the performance of

[5] As we obtain many estimates of the same effect this raises the issue of the multiple comparisons or the multiple testing problem when we the range and the distribution of estimates that are individually "statistically significant". One way to interpret this distribution is as follows: Suppose different studies pick one of the 288 estimates at random. If the study finds a statistically significant effect the study is published. If not, the study is shelved or does not get through the publication process. A survey paper reporting the estimated effects in the literature would then report this distribution of statistically significant effects.

all all competing index fund managers, which replicate the same index. Active asset managers however, who hold a unique portfolio, could outperform other active asset managers if their portfolio firms compete less and thereby attract new clients.

Perhaps surprisingly, the estimates for "Direct Shareholders" or "Active Investors" are similar as the estimates if all investors are taken into account. These estimates are however somewhat preliminary because we only take the largest "Direct Shareholders" and the largest "Active Investors" into account.

Identification and Endogeneity Which variation in the data identifies the coefficient on the weight firms place on their own profits? The answer to this question depends on the sample restrictions and the specification. Here we discuss the most basic case that relies mainly on comparisons of unlisted and listed banks: Unlisted banks have typically no common owners with other banks and therefore place 100 percent weight on their own profits throughout the sample period. Listed banks however share common owners and the model-implied weight on their own profits is surprisingly low (typically below 10 percent). Moreover, for listed banks common ownership became more prevalent between 2001 and 2016, so the weight these banks placed on their own profits in 2001 is about four times higher than in 2016. This variation is used in some of our estimates. In the simplest specification without bank fixed effects we ask whether banks that place more weight on their own profits make higher profits.[6] In specifications with bank fixed effects, we ask whether the decrease in weight on own profits among listed banks was associated with a reduction in their profits.

We do not try to instrument for the profit weights in this version of the paper. The conclusions of the existing literature that finds anticompetitive effects of common ownership do not rely heavily on whether profit weights were treated as exogenous or not. Moreover, we believe that a large portion of the variation in profit weights and the secular increase in common ownership are driven by factors that are plausibly exogenous. The studies by Azar, Schmalz, and Tecu (2016) and Azar, Schmalz, and Tecu (2016) find anticompetitive effects of common ownership in OLS and IV specifications. In Gramlich and Grundl (2017) the OLS and IV estimates for the same subsample do not differ substantially. Kennedy, O'Brien, Song, and Waehrer (2017) find positive and statistically significant effects of common ownership with OLS and negative and

[6] As we discuss in more detail below, these estimates typically find a fairly large negative association between the weight on own profits and profits, because listed banks make higher profits than unlisted banks.

significant effects in their IV approach. This suggests that treating the profit weights as exogenous could bias our findings towards finding anticompetitive effects of common ownership. The secular trend towards increased common ownership is largely driven by the trend towards passively investing asset managers. We believe that this variation is plausibly exogenous.

Roadmap The remainder of this paper is structured as follows. In section 2 we discuss the model by O'Brien and Salop (2000) and show in a numerical example how shifts in profits weights shift lead to shifts in profits.. In section 3 we discuss the data. Section 4 discusses the range of estimates we obtain and section 5 presents the findings. In section 6 we obtain estimates if only common ownership through "Direct Shareholders" or through "Active Investors" is taken into consideration. Section 7 concludes. Tables that are not included in the main text can be found in Appendix A. A more detailed description of the 13F data can be found in Appendix B.

2 Common Ownership Model

The model by O'Brien and Salop (2000) is the basis for much of the empirical research on the competitive effects of common ownership.[7] In this model managers maximize a weighted sum of their shareholders' payoffs:

$$\sum_i \gamma_{ij} \sum_k \beta_{ik} \pi_k \tag{1}$$

Managers are indexed by j and k, and shareholders by i. γ_{ij} is owner i's "control share" of firm j, which is the weight that manager j assigns to owner i's payoff. For each firm j, the control shares add up to one $\sum_i \gamma_{ij} = 1$. β_{ik} is owner i's ownership share of firm k, which is the percentage of firm k's profits, π_k, which accrue to owner i. For each firm k, the ownership shares add up to one $\sum_i \beta_{ik} = 1$. It natural to assume that γ_{ij} is a non-decreasing function of β_{ij}: as i's ownership of firm j increases, manager j should place weakly more weight on i in its objective function. Generally, γ_{ij} likely depends not only on β_{ij}, but the whole ownership structure of firm j. For example, a ownership share of $\beta_{ij} = 0.49$ might result in almost full control if all other shareholders are small, and in almost no control if the remaining 51% are held by a single shareholder. Much of

[7] Large parts of this model section are identical to parts of the model section in Gramlich and Grundl (2017).

the empirical literature assumes that $\gamma_{ij} = \beta_{ij}$, which is called the proportional control assumption.

After dividing by $\sum_i \gamma_{ij}\beta_{ij}$, manager j's maximization problem in 1 can be rewritten as follows:

$$\begin{aligned} \Pi_j &= \pi_j + \sum_{k \neq j} \frac{\sum_i \gamma_{ij}\beta_{ik}}{\sum_i \gamma_{ij}\beta_{ij}} \pi_k \\ &= \widetilde{w}_{jj}\pi_j + \sum_{k \neq j} \widetilde{w}_{jk}\pi_k \end{aligned} \tag{2}$$

The profit weights $\widetilde{w}_{jk} = \sum_i \gamma_{ij}\beta_{ik} / \sum_i \gamma_{ij}\beta_{ij}$ measure the weight firm j places on the profits of rival k, relative to its own profits $\widetilde{w}_{jj} = 1$.

An important property of the profit weights is that they are not symmetric in the sense that in general $\widetilde{w}_{jk} \neq \widetilde{w}_{kj}$.[8] This is generally the case even if all common owners of j and k have equal shares in both firms, because the weights also depend on the size of the ownership shares among the non-common owners. To see this consider an example with just two firms that have a single common owner who holds 10% of both firms. First suppose that the remaining 90% of both firms are held by by single investors, then $\widetilde{w}_{12} = \widetilde{w}_{21} \approx 0$. Now suppose that the 90% shareholder of firm 2 is split into many equal sized shareholders who each only hold a small share of firm 2, then $\widetilde{w}_{21}$ starts to increase whereas $\widetilde{w}_{12} \approx 0$. This is because the 90% ownership in firm 1 by undiversified shareholders is concentrated in a single shareholder whereas is unconcentrated and spread across many shareholders for firm 2.

For our purposes it will be more convenient to work with weights that add up to one. Divide equation (1) by $\sum_i \sum_k \gamma_{ij}\beta_{ik}$ to obtain

$$\begin{aligned} & \sum_k \frac{\sum_i \gamma_{ij}\beta_{ik}}{\sum_i \sum_k \gamma_{ij}\beta_{ik}} \pi_k \\ = & \sum_k w_{jk}\pi_k \end{aligned} \tag{3}$$

where $\sum_k w_{jk} = 1$.

In this paper we estimate whether changes in w_{jj}, the weight firm j places on its own profits, and $\sum_{k \neq j} w_{kj}$, the total weight weight $j's$ rivals place on j's profits are

[8] The fact that $\widetilde{w}_{jk} \neq \widetilde{w}_{kj}$ means that the common ownership model makes very specific testable predictions at the level of the ordered firm pair: For example one could test whether firm j starts to compete less aggressively with firm k as $\widetilde{w}_{jk}$ increases while controlling for $\widetilde{w}_{kj}$ and for firm pair fixed effects.

associated with changes in the reported profits.

2.1 A Numerical Example

Here we present a simple numerical example illustrating how prices, quantities and profits change depend on the profit weights in a model of differentiated product Bertrand competition.

In the example there are three banks $j = 1, 2, 3$. Banks 1 and 2 are listed on the stock market and therefore have common owners whereas bank 3 is private. Thus $\widetilde{w}_{31} = \widetilde{w}_{32} = 0$, $\widetilde{w}_{13} = \widetilde{w}_{23} = 0$, but $\widetilde{w}_{12}$ and $\widetilde{w}_{21}$ can be positive. The banks have constant marginal costs c_j. Demand is a simple logit demand system where the prices are the only product characteristics.

In Figure 1 we begin by showing how prices, quantities and profits change as common ownership among banks 1 and 2 increases such that $\widetilde{w}_{12}$ and $\widetilde{w}_{21}$ increase jointly. This symmetric case can be viewed as a partial merger among the two banks. The demand system is symmetric and the banks have identical marginal costs.

Figure 1a shows that the prices of banks 1 and 2 increase as they are now competing less aggressively. The prices of bank 3 also increase as it faces two less aggressive competitors now, but less so than the prices of banks 1 and 2. Figure 1b shows that the quantities of banks 1 and 2 decrease whereas the quantity of bank 3 also increases. As the prices of all banks increase the quantity of the outside good increases.

Figure 1c shows that the profits of all three banks increase as competition in the industry becomes less aggressive. Importantly, the profits of banks 1 and 2 increase much less than the profits of bank 3. This is shown more clearly in Figure 1d, which shows the difference between the profits of a bank and average industry profits. As $\widetilde{w}_{12}$ and $\widetilde{w}_{21}$ the profits of banks 1 and 2 fall below average industry profits, whereas the profits of bank 3 rise above average industry profits.

Next, consider Figure 2. Here $\widetilde{w}_{12}$ and $\widetilde{w}_{21}$ do not increase jointly. Instead $\widetilde{w}_{12}$ increases and $\widetilde{w}_{21} = 0.5$ is fixed. Demand and costs are symmetric as in the previous example.

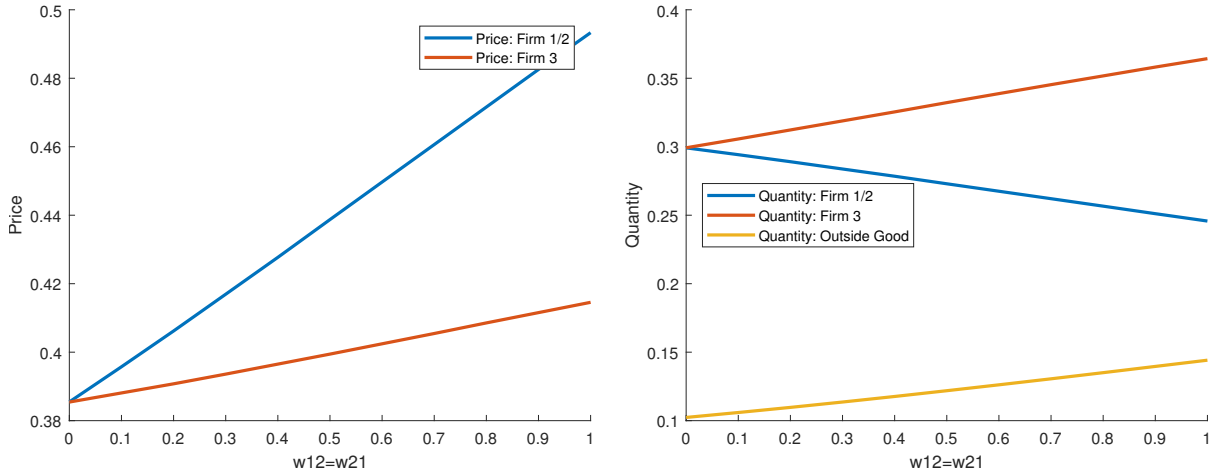
Figure 2a shows that now the price of bank 1 increases a lot, whereas the prices of banks 2 and 3 increase only slightly. Accordingly, the quantity of bank 1 decreases, whereas the quantities of banks 2 and 3 and the outside good increase (Figure 2b).

Figure 2c, shows that the profits of banks 2 and 3 increase. Notice that the profit of bank 1 initially increases slightly as $\widetilde{w}_{12}$ increases and then decreases. Why is this

the case? Intuitively, increasing $\widetilde{w}_{12}$ has two effects: First, it lowers competition among the banks. Second, for a given level of competition it lowers how much of the industry profits go to bank 1. The profit of bank 1 is not monotone in $\widetilde{w}_{12}$ because initially the first effect dominates and later the second effect.

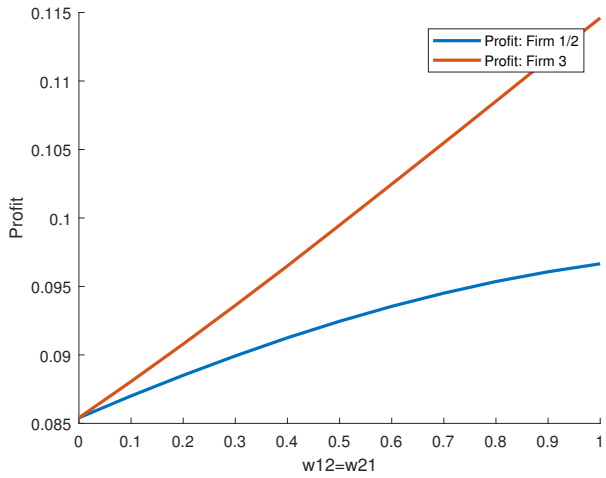
In Figure 2d the deviation from average industry profits is shown. Relative to the industry average, the profits of banks 2 and 3 are increasing whereas the profits of bank 1 is dereasing.

This latter shift in profits is the one we are trying to find in the data: Do the profit of a bank decrease relative to the average profits in the industry as it places more weight on the profits of its rivals and less weight on itself.

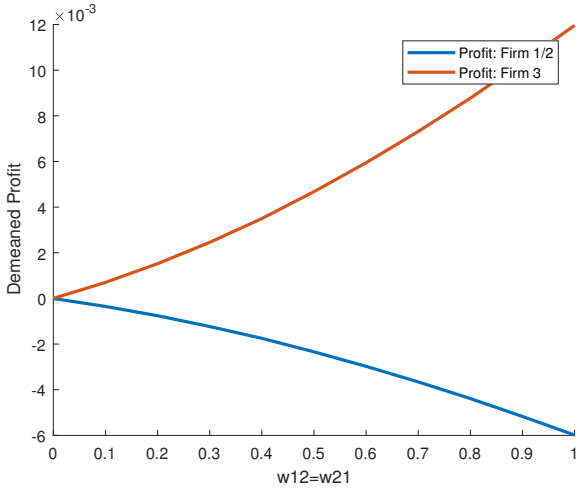


(a) Prices

(b) Quantities

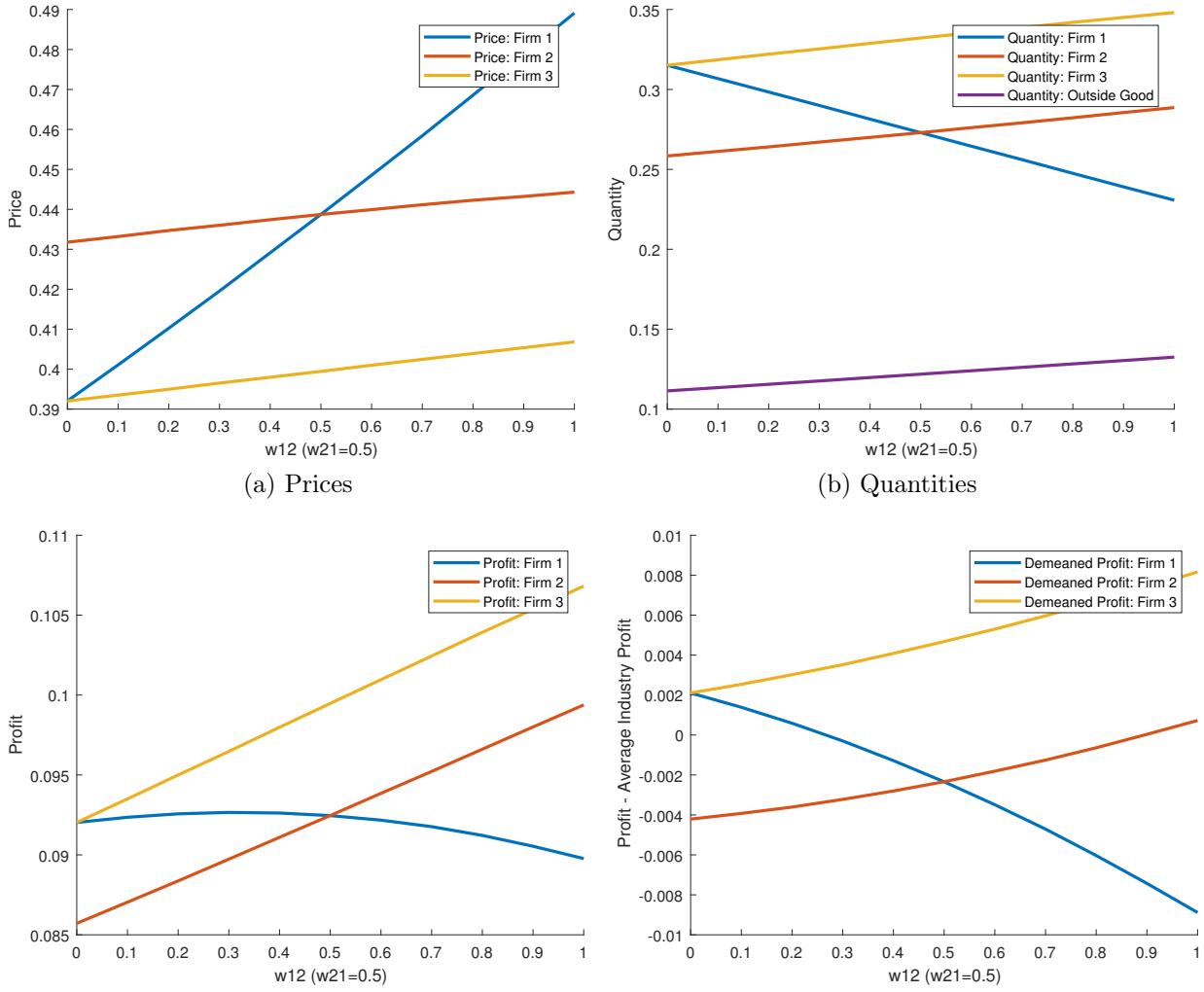


(c) Profits



(d) Profits - Average Industry Profits

Figure 1: These figures show how prices, quantities, profits and the deviation from average industry profits change as $\widetilde{w}_{12}$ and $\widetilde{w}_{21}$ increase jointly.



(a) Prices (b) Quantities

(c) Profits (d) Profits - Average Industry Profits

Figure 2: These figures show how prices, quantities, profits and the deviation from average industry profits change as $\widetilde{w}_{12}$ increases whereas $\widetilde{w}_{21} = 0.5$ remains constant.

3 Data and Descriptive Statistics

3.1 Data

The data on bank profits, equity and assets comes from regulatory filings. Bank Holding Companies (BHCs) with more than $1 billion in assets have to file a Y-9C form. The Y-9C form is consolidated across the different subsidiaries of the BHC. For smaller BHCs or banks that are not BHCs we obtain data from the call report, that is filed by all regulated financial institutions.

Data on bank ownership comes from the filings of SEC form 13F that are mandatory for institutional investors with more than $100m in assets. Some investors file separate 13F forms for their different subsidiaries (e.g. Blackrock). In this case we aggregate the ownership shares across 13F filers.

We do not observe bank shareholders that are not 13F filers. If these shareholders are small individually relative to the observed shareholders they would only have a limited impact on the profit weights, even if they collectively account for a substantial fraction of the ownership for some banks, because in the common ownership model of O'Brien and Salop (2000) shareholders that are individually large have a disproportionate impact on the profit weights. See Gramlich and Grundl (2017) for a more detailed explanation of this model property. If the unobserved shareholders are however individually large, they can have a large impact on the profit weights. This problem may be particularly important for smaller banks and early in our sample period, because the 13F filers only account for a small fraction of the ownership. We try to mitigate this data limitation by controlling for the total 13F ownership share in some of our specifications and by excluding bank-quarter observations for which the 13F ownership share is low in some of our subsamples.

3.2 Descriptive Statistics

Table 1: **Summary Statistics.** The Return on Assets and Return on Equity are annualized. The Capital Ratio, Return on Assets and Return on Equity are expressed in %. Net Income, Total Assets and Total Equity are measured in millions of dollars. Net Income is measured quarterly.

	mean	sd	p25	p50	p75
Weight on Own Profits	93.9	23.6	100.0	100.0	100.0
Total Weight Received from Rivals	6.0	28.5	0.0	0.0	0.0
Net Income	6.9	178.7	0.1	0.4	1.1
Return on Assets	1.2	1.6	0.6	1.2	1.9
Return on Equity	12.9	15.9	6.0	11.9	20.3
Capital Ratio (Total Equity / Total Assets)	11.0	5.4	8.5	10.0	12.1
Total Assets	2270.9	44810.9	65.2	139.2	322.8
Total Equity	219.3	4242.3	7.0	14.3	32.1
Observations	401341				

Table 1 shows summary statistics for the whole sample. Figure 3 shows that the median weight on own profits (w_{jj}) among listed banks has declined substantially and has reached about 40% of its 2001 level in 2016, whereas the weight on own profits among private banks remained unchanged. Moreover (not shown on the graph) the level of w_{jj} for the vast majority of listed banks is very low and typically far below 10%.

Figure 4 shows how profits, ROE and ROA for listed and unlisted banks have evolved since 2001. Figure 4a shows the total net income of listed and unlisted banks. With the exception of the financial crisis the total net income of the approximately 500 listed banks exceeds the total net income of the more than 5,000 unlisted banks substantially. In the years before the financial crisis when w_{jj} for listed banks fell substantially, the gap between listed and unlisted banks widened. During the crisis the gap closed before it widened again in the years after the crisis. The relative changes can be seen more easily in Figure 4b where net income is normalized by the 2001 level.

Figure 4 also shows how ROE and ROA have evolved. These figures are more difficult to link to the common ownership model by O'Brien and Salop (2000), which does not model debt/equity choices and assumes that shareholders care about the profits of the firms they own.[9] The graphs show no clear pattern for ROA, but for ROE we see that listed banks had higher ROE prior to the crisis but the gap closed after the crisis. This can likely be partially explained by regulatory changes after the crisis which increased capital requirement especially for larger banks and restricted some activities with particularly high ROEs.

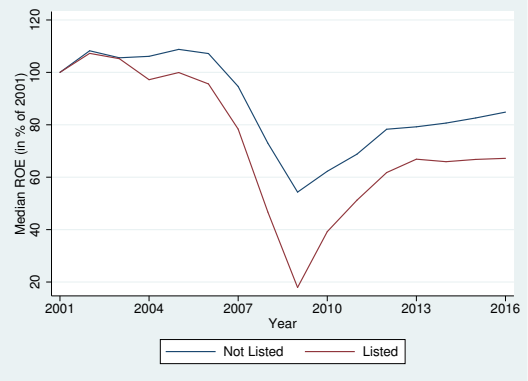
[9] If total assets are interpreted as the quantity of firm j then $ROA_j = p_j - c_j$. This suggests that decreasing w_{jj} should be associated with increasing ROA_j.

Figure 3: Median w_{jj} (as % of 2001)

(a) Total Net Income in $B

(b) Total Net Income (as % of 2001)

(c) Median ROE



(d) Median ROE (as % of 2001)

(e) Median ROA

(f) Median ROA (as % of 2001)

Figure 4: Profits, ROE and ROA for listed and unlisted banks over time.

4 Subsamples, Profit Weights and Specifications

We estimate the effect of w_{jj} on three outcome variables. First, the bank's profit π_j, second the return on equity $ROE_j = \frac{\pi_j}{E_j}$, and third the return on assets $ROA_j = \frac{\pi_j}{A_j}$. One reason to estimate the effect on ROE_j and ROA_j in addition to π_j is that these profitability ratios are more easily comparable across banks of different sizes.

We winsorize ROE_j and ROA_j by quarter at the 2.5th and 97.5th percentiles to reduce the impact of outliers, especially during the financial crisis. As net income is not comparable across banks of different size we do not winsorize it. Therefore outliers, especially during the crisis, can have a large impact on the net income estimates.

For all three outcome variables we also consider a quarterly transformation into percentiles: For example, the bank with the highest net income in some quarter has the net income percentile 100 and the bank with the lowest net income has the net income percentile 0. The advantage of this transformation is twofold. First, it makes the effect sizes for the three different outcome variables comparable. Second, for net income, which is not winsorized, it reduces the impact of outliers during the financial crisis, when some banks posted negative net incomes that were much larger in magnitude than the magnitude of net income during "normal times".

There are many plausible regression specifications to estimate the effect of w_{jj} on these outcome variables. Moreover, there are several plausible ways of choosing the subsample of banks and the sample period. Lastly, there are several plausible ways to calculate the profit weights. We obtained estimates for several different specifications, subsamples and ways to calculate the profits weights and present the whole range of estimates we obtained.

Subsamples Table 2 shows the twelve different subsamples we consider. The first subsample is the entire dataset, i.e. it contains all banks from 2001 to 2016 and the subsamples 2-12 restrict the sample in various ways, which we discuss in this section.

Table 2: **Subsamples**

	Banks	Years	13F-Ownership Restriction	Bank-Quarter Observations
1	All Banks	2001-2016	No	401,341
2	Only Listed Banks	2001-2016	No	24,475
3	All Banks	2001-2007	No	190,023
4	All Banks	2008-2010	No	76,267
5	All Banks	2011-2016	No	135,051
6	All Banks	2001-2016	Yes	379,494
7	Only Listed Banks	2001-2016	Yes	9,751
8	All Banks	2001-2007	Yes	178,742
9	All Banks	2008-2010	Yes	72,199
10	All Banks	2011-2016	Yes	128,553
11	\$500m<Assets<\$3,000m	2001-2016	No	52,982
12	\$500m<Assets<\$3,000m	2001-2016	Yes	40,597

Subsamples 2 and 7 contain only listed banks, whereas the remaining subsamples also contain unlisted banks. For banks that are not listed $w_{jj} = 1$, whereas w_{jj} is substantially smaller for listed banks. Therefore there is a lot more variation of w_{jj} across banks in the subsamples that contain both listed and unlisted banks. In specifications without bank fixed effects the coefficient on w_{jj} is estimated mainly by comparing listed and unlisted banks in the subsamples that contain unlisted banks, whereas for subsamples 2 and 7 we can only use variation within the listed banks.

Subsamples 11 and 12 are restricted to banks between \$500m and \$3,000m in assets. We consider this restriction because listed banks tend to be larger than unlisted banks. There are few listed banks below \$500m and few unlisted banks above \$3,000m in assets. Subsamples 11 and 12 restrict the sample to the asset size range where the size distributions of listed and unlisted banks overlap.

We also vary the sample period. Subsamples 3 and 8 restrict the sample to the pre-crisis period 2001-2007, subsamples 4 and 8 are restricted to the crisis period 2008-2010 and subsamples 5 and 10 are restricted to the post-crisis period 2011-2016. We consider these subsamples because the financial crisis and subsequent changes in regulation may have affected listed and unlisted banks in systematically different ways. For example it appears that listed banks were more leveraged than unlisted banks before the crisis but this gap closed after the crisis, possibly due to stricter capital requirements.

Lastly, we consider a restriction that excludes banks that went public during the sample period. If a bank goes public this can result in a large, sudden decline of w_{jj}.

The idea of this restriction is that we do not want to use variation in w_{jj} that is due to decisions of the bank's management. As this restriction eliminates some within-bank variation of w_{jj} it leads to much larger standard errors. We implement the restriction in a very strict way: We require that if a bank is ever listed during the sample period, then we only keep it if the 13F filers account for at least 5 percent of the market capitalization at all times during the sample period. Therefore, this restriction eliminates not only banks that go public during the sample period, but also some listed banks that are taken over and some small listed banks.[10] Subsamples 6 to 10 and subsample 12 impose this "13F Ownership Restriction".

Calculate Profit Weights[11] The 13F data only contains information on the holdings by institutional investors with more than $100 million in assets. 13F holders more than one half of the public banks. To calculate the profit weights, however, requires the entire ownership structure. We assume that the remaining shareholders are atomistic and not diversified. Such shareholders have no impact on the objective function of the manager if there is at least one non-atomistic shareholder. We believe that this assumption is a reasonable approximation because most shareholders who are not required to file a 13F form are presumably small compared to the 13F filers.

However, if large parts of a firm are held by small undiversified shareholders then even a small amount of common ownership can have a large impact on the profit weights. This is relevant if the 13F filers own only a relatively small share of some publicly traded banks. To address this issue we calculate the profit weights under the assumption that for every bank there is one (unobserved) undiversified shareholder who holds 1% in some specifications. This 1% undiversified shareholder could represent the management of the bank, for example.

Azar, Raina, and Schmalz (2016) argue that in the banking industry there is cross ownership in addition to common ownership, because many of the 13F filers are banks. These reported holdings predominantly represent the holdings of the asset management divisions of the banks. If the asset management divisions use their control rights in the interest of the bank they belong to then such holdings should be treated as cross

[10] For banks that are taken over we sometimes do no longer record any ownership by 13F filers in the last quarter for which we observe balance sheet and income statement information. For small banks that are not contained in the major stock market indices 13F owners sometimes account for less than 5 percent of the market capitalization, especially during the early parts of our sample period.

[11] The following description of Table 3 is largely identical to the analogous discussion in Gramlich and Grundl (2017).

ownership. It could however also be argued that it is the fiduciary duty of the asset management division to act in the best interest of their customers and therefore they must use their control rights in the interest of their customers.[12] This argument suggests that the holdings of the asset management divisions should be treated in the same manner as the holding by independent asset managers. Therefore, they do not result in cross ownership, but might result in common ownership. In some specifications we assume that holdings by bank-owned asset managers result in cross ownership and in others we treat them like independent asset managers.

Table 3 summarizes the four different ways in which we calculate the profit weights.

Table 3: **Ways to Calculate Profit Weights**

	1 % Undiversified Shareholder	Cross Ownership
1	Yes	No
2	No	Yes
3	Yes	Yes
4	No	No

Specifications For each combination of the twelve subsamples (Table 2) and the four different ways to calculate the profit weights (Table 3) we consider six different specifications. For illustration these specifications are shown in Tables 4 (Net Income), 14 (ROE) and 15 (ROA) using the first rows of Tables 2 and 3, i.e. we use the entire sample and calculate the profit weights under the assumption that there is an additional unobserved, undiversified one-percent shareholder and without assuming that the holdings by the asset management arms of banks result in cross-ownership. The standard errors are clustered at the quarter level for all of our estimates.

We start with the very basic specification (1), shown in the first columns of Tables 4, 14 and 15, and succesively add more controls in specifications (2)-(6). In specification (1), we simply regress the three outcome variables on the weight placed on own profits (w_{jj} or "Ownweight") and a set of quarterly fixed effects. This specification, therefore uses variation across banks. In Specification (2) we add bank fixed effects. In specifiction (3) we additionally control for the profit weight the bank receives from rivals ($\sum_k w_{kj}$ or "Rivalweight"). In specification (4), we add the total ownership share of 13F

[12] Notice that we treat the holdings of independent asset managers act as if they act in the best interest of their customers, despite the fact that they typically earn fees that are a small percentage of assets under management and therefore benefit less from reduced competition among their portfolio firms than if they would own the stocks.

filers as a control. We add this control to rule out the possibility that our findings are driven by fraction of shareholders we observe, rather by the composition of shareholders we observe. Let j denote a bank and q a quarter then formally specification (4) looks as follows:

$$y_{jq} = \beta_1 \underbrace{Ownweight_{jq}}_{=w_{jj,q}} + \beta_2 \underbrace{Rivalweight_{jq}}_{=\sum_k w_{kj,q}} + \beta_3 13F\,Ownership\,Share_{jq} + \mu_q + \xi_j + \epsilon_{jq} \quad (4)$$

In specifications (5) and (6), we control for the size of the bank as measured by the size of its balance sheet. Controlling for the size of the balance sheet is problematic, because it is itself an outcome and a choice by the bank. Banks that place higher weight on their own profits may have a greater incentive to grow their balance sheet. Nevertheless, we present results that control for balance sheet size because the estimates in Azar, Raina, and Schmalz (2016) that find anticompetitive effects of common ownership control for bank size. In specification (5) we control for bank size by including the log of its balance sheet size. In specification (6) we control for bank size in a more flexible way by including dummies for each decile of the bank size distribution that we interact with the quarter dummies.

First, consider net income shown in Table 4. In specification (1), we find a negative association between net income and Ownweight. This negative association simply reflects the fact that the largest banks with the highest net income are listed and therefore have low Ownweight. Hence, when we look across banks the evidence is at odds with the predictions of the model. However, there is the reverse causality concern that the banks with high net income, or banks that expect high net income in the future decide to raise capital by listing their stock. This concern is largely eliminated in specifications (2)-(6) that include bank fixed effects and therefore use variation withint bank over time.[13] In these specifications we find a much smaller negative association between Ownweight and net income. However, we do not find a positive association between Ownweight and net income in any of the specifications.

Next, consider ROE shown in Table 14. We find a positive association between Ownweight and ROE in all six specifications. In specification (1) the effect is small and not statistically significant. In specifications (2)-(4) with bank fixed effects the effect

[13]The reverse causality concern is still present for banks that go public (or delist) during the sample period. In subsamples 6-10, we therefore exclude these banks.

size increases to 0.01-0.02 and is statistically significant. Controlling for bank size in specifications (5) and (6) increases the effect size further to 0.02-0.03. What's the economic significance of these effect sizes? As both Ownweight and ROE are measured in percentage points, an effect size of 0.03 implies that increasing Ownweight by one percentage point increases the ROE by 0.03 percentage points. This is roughly equal to 0.25% of the average ROE (12.9) and 0.19% of the standard deviation of ROE (15.9).

Lastly, consider ROA shown in Table 14. Here we also find some evidence of a positive association, especially for specifications (5) and (6) that control for bank size. The largest effect size in specification (5) is close to 0.003, which corresponds to about 0.25% of the average ROA (1.2) or about 0.19% of the standard deviation (1.6).

Tables 16, 17 and 18 show the estimates if the variables are transformed into percentiles. For net income we find negative effects in specifications (1)-(4) and positive effects in specifications (5)-(6). For ROE and ROA we find mixed results for specifications (1)-(4) and positive effects for specifications (5)-(6). The largest effects sizes we find for each of the three outcome variables are in the range 0.02-0.03. This means that increasing Ownweight by one percentage point leads to a shift in the distribution of about 0.03 percentage points in the distributions of net income, ROE and ROA.

Table 4: **Net Income.**

	(1)	(2)	(3)	(4)	(5)	(6)
Weight on Own Profits	-0.939***	-0.0559*	-0.302*	-0.146	-0.127	-0.157
	(0.0730)	(0.0216)	(0.142)	(0.0835)	(0.0805)	(0.0906)
Total Weight Received from Rivals			-0.330	-0.764*	-0.762*	-0.591
			(0.189)	(0.350)	(0.350)	(0.343)
13F Ownership Share				186.9*	182.5*	114.2
				(70.38)	(69.77)	(65.57)
log(Total Assets)					6.623**	
					(2.284)	
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	No
Bank Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Asset Decile x Quarter Fixed Effects	No	No	No	No	No	Yes
N	401341	401229	401229	401229	401229	401229

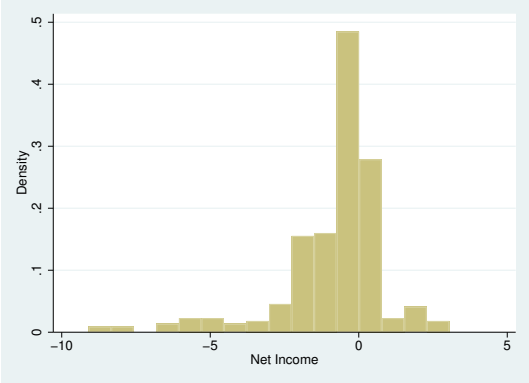
Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

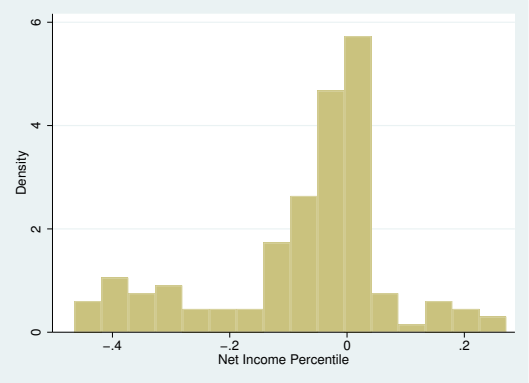
5 Findings

Summary of Findings In this section we summarize the different estimates of the Ownweight coefficient, that vary the subsample (Table 2), the ways to calculate profits weights (Table 3), and the specification. As we consider 12 different subsamples, 4 ways to calculate profit weights and six different specifications, we obtain $12 * 4 * 6 = 288$ different estimates of the Ownweight coefficient for each outcome variable. Overall we consider six outcome variables, namely net income, ROE and ROA, and the transformation of each of these variables into percentiles by quarter (henceforth, "percentile transformation"). Regression tables for all estimates that we summarize in this section can be found in the Online Appendix.

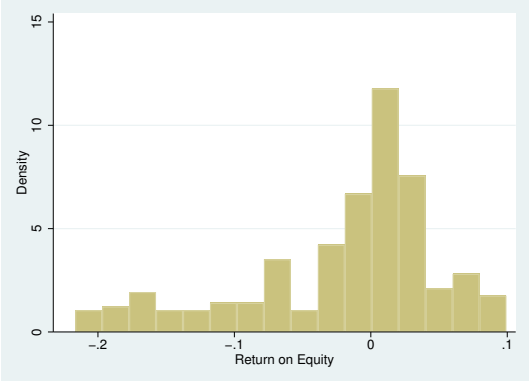
Figure 5 shows histograms of the 288 point estimates for each of the six outcome variables. These distributions are also summarized in Table 5. Importantly, Figure 5 and Table 5 show all point estimates regardless of whether they are statistically different from zero or not.



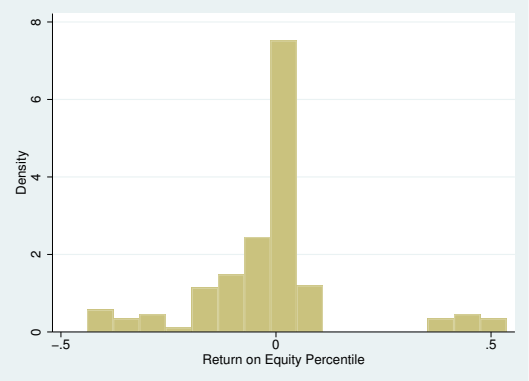
(a) Net Income



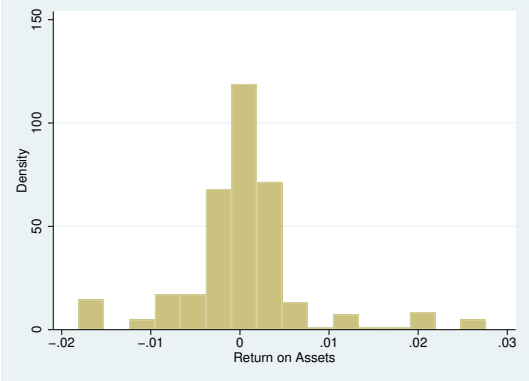
(b) Net Income Percentile



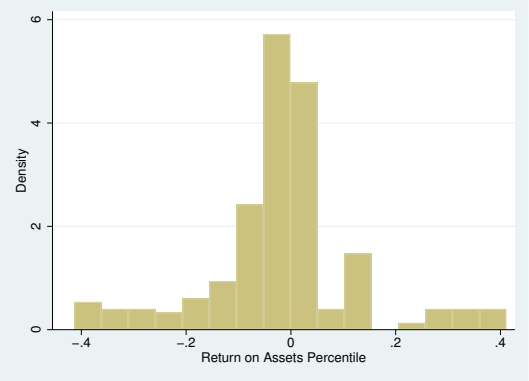
(c) ROE



(d) ROE Percentile



(e) ROA



(f) ROA Percentile

Figure 5: **Histograms of Point Estimates.** These histograms show the distribution of the 288 point estimates we obtain for the three outcome variables net income (row 1), return on equity (row 2) and return on assets (row 3). For the estimates on the right hand side these variables are transformed into percentiles for each quarter, which makes the estimates for net income, return on equity and return on assets more easily comparable.

Table 5: **Distribution of Point Estimates**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
Net Income	-0.837	-9.093	-8.144	-4.739	-1.422	-0.210	0.046	1.280	2.740	3.051	288
Net Income Percentile	-0.074	-0.465	-0.464	-0.394	-0.124	-0.033	0.011	0.148	0.237	0.272	288
Return on Equity	-0.019	-0.217	-0.213	-0.173	-0.054	0.003	0.024	0.077	0.091	0.099	288
Return on Equity Percentile	-0.012	-0.439	-0.436	-0.338	-0.071	-0.002	0.028	0.411	0.494	0.536	288
Return on Assets	0.000	-0.018	-0.018	-0.010	-0.002	0.001	0.002	0.013	0.025	0.028	288
Return on Assets Percentile	-0.016	-0.413	-0.406	-0.308	-0.058	-0.009	0.023	0.286	0.385	0.412	288

The distribution of point estimates is roughly centered around zero for all six outcome variables. We will focus in our discussion on the percentile transformations, because they are easier to interpret and comparable across different outcome variables. For the net income percentile our estimates range from -0.47 to +0.27, with a median estimate of -0.03. For the ROE percentile our estimates range from -0.44 to +0.49, with a median estimate of -0.002. Lastly, for ROA our estimates range from -0.41 to +0.41, with a median of -0.009. While most of the point estimates are small in magnitude the largest estimates are economically substantial. For example an estimate of +0.5 implies than an increase in Ownweight of 1 percentage point would lead to a shift in the distribution of the outcome variable by 0.5 percentage points.

Figure 5 and Table 5 show all point estimates regardless of their precision. In Table 6 we only summarize estimates that are statistically significant at the one percent level. Depending on the outcome variable roughly one third to one half of the point estimates are statistically significant. The distributions are still roughly centered around zero for all outcome variables. Focusing on estimates that are statistically significant however shrinks the range of the effect sizes in some cases considerably. The range for the net income percentile is now -0.465 to 0.09 with a median of -0.09. The range for ROE is -0.44 to 0.08 with a median of -0.04. Lastly, the range for ROA is -0.41 to 0.15 with a median of -0.03. This shows that some of the large positive estimates in Table 5 are noisy.

Table 6: **Distribution of Statistically Significant Estimates (1 percent level)**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
Net Income	-1.110	-9.093	-9.071	-3.233	-2.132	-0.939	-0.011	2.149	2.942	3.051	117
Net Income Percentile	-0.152	-0.465	-0.465	-0.436	-0.310	-0.085	-0.030	0.043	0.084	0.086	148
Return on Equity	-0.040	-0.217	-0.217	-0.209	-0.136	0.010	0.028	0.030	0.065	0.065	92
Return on Equity Percentile	-0.115	-0.439	-0.439	-0.413	-0.261	-0.041	0.023	0.037	0.084	0.084	91
Return on Assets	-0.002	-0.018	-0.018	-0.018	-0.005	0.002	0.003	0.006	0.007	0.007	94
Return on Assets Percentile	-0.066	-0.413	-0.413	-0.401	-0.184	-0.026	0.030	0.127	0.150	0.152	112

So far we have only summarized the point estimates. In Table 7 we summarize the distribution of the upper bounds of the 99 percent confidence intervals around the point estimates in Table 6. Interestingly, these upper bounds are still roughly centered around zero. For the net income percentile they range from -0.46 to +0.14, with a median of -0.045. For the ROE percentile they range from -0.25 to +0.11, with a median of -0.03. For the ROA percentile they range from -0.21 to +0.26, with a median of -0.006.

Table 7: **Distribution of Upper Bounds of 99 Percent CIs for Statistically Significant Estimates**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
Net Income	-0.241	-5.207	-5.180	-2.578	-0.776	-0.162	-0.003	3.634	4.553	4.674	117
Net Income Percentile	-0.097	-0.460	-0.460	-0.418	-0.162	-0.045	-0.008	0.065	0.138	0.140	148
Return on Equity	0.007	-0.070	-0.070	-0.060	-0.037	0.019	0.045	0.052	0.093	0.093	92
Return on Equity Percentile	-0.047	-0.250	-0.250	-0.225	-0.138	-0.029	0.044	0.071	0.110	0.110	91
Return on Assets	0.002	-0.006	-0.006	-0.005	-0.002	0.004	0.004	0.010	0.011	0.011	94
Return on Assets Percentile	0.004	-0.208	-0.207	-0.198	-0.070	-0.006	0.050	0.232	0.258	0.262	112

Estimates by Subsample After discussing the distribution of estimates in general we now discuss how the distribution of estimates differs for different subsamples. Tables 8, 19 and 20 show the distributions of point estimates by subsample, for the net income, ROE and ROA percentiles. In all three cases, the estimates that are largest in magnitude are concentrated in subsamples 4 and subsamples 6-8 and especially subsamples 9 and 10. These are also the subsamples with the largest standard errors as shown in Tables 21, 22 and 23. In particular the standard errors for subsamples 9 and 10 are about one order of magnitude larger than for most other subsamples.

Consquently, many of the point estimates for these subsamples are not statistically significant. Tables 24, 25 and 26 show only the statistically significant estimates (at the one percent level). Subsamples without any statistically significant estimates are not shown in these tables. The tables show that only few of the estimates for subsamples 4 and 6-10 are statistically significant, though the largest positive and statistically significant estimates can still be found in these subsamples.

Table 8: **Distribution of Net Income Percentile Estimates by Subsample**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.071	-0.340	-0.340	-0.339	-0.058	-0.036	0.017	0.023	0.024	0.024	24
2	-0.124	-0.317	-0.317	-0.316	-0.128	-0.097	-0.070	-0.033	-0.030	-0.030	24
3	-0.106	-0.398	-0.398	-0.397	-0.084	-0.061	-0.020	-0.018	-0.017	-0.017	24
4	-0.025	-0.129	-0.129	-0.129	-0.037	-0.005	0.011	0.014	0.016	0.016	24
5	-0.079	-0.377	-0.377	-0.376	-0.087	-0.022	0.006	0.028	0.029	0.029	24
6	-0.077	-0.415	-0.415	-0.415	-0.138	-0.034	0.004	0.159	0.160	0.160	24
7	-0.285	-0.385	-0.385	-0.383	-0.336	-0.303	-0.222	-0.165	-0.165	-0.165	24
8	-0.063	-0.465	-0.465	-0.465	-0.013	0.003	0.018	0.084	0.086	0.086	24
9	0.020	-0.237	-0.237	-0.237	-0.107	0.030	0.170	0.270	0.272	0.272	24
10	-0.027	-0.437	-0.437	-0.437	-0.078	-0.008	0.151	0.236	0.237	0.237	24
11	0.021	-0.027	-0.027	-0.027	0.009	0.029	0.040	0.046	0.046	0.046	24
12	-0.076	-0.206	-0.206	-0.205	-0.105	-0.064	-0.021	-0.000	0.003	0.003	24
Total	-0.074	-0.465	-0.464	-0.394	-0.124	-0.033	0.011	0.148	0.237	0.272	288

Estimates by Weight Calculation Tables 9, 27 and 28 show the distribution of estimates for the different ways to calculate the profit weights shown in Table 3. Overall, the distributions are very similar so the way how the profit weights are calculated has only a minor influence on the estimates. The estimates in rows 1 and 4 are very similar and the estimates in rows 2 and 3 are very similar, but there is some gap between both of these pairs. Thus, the assumption about cross ownership appears to have a noticable yet small effect on the estimates whereas the assumption about the extra one percent undiversified shareholder has almost no impact on the estimates.

Table 9: **Distribution of Net Income Percentile Estimates by Profit Weight Calculation.** The rows of this table correspond to the rows of Table 3.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.067	-0.465	-0.465	-0.398	-0.098	-0.028	0.011	0.163	0.270	0.270	72
2	-0.081	-0.464	-0.464	-0.393	-0.126	-0.038	0.012	0.139	0.202	0.202	72
3	-0.077	-0.464	-0.464	-0.397	-0.117	-0.035	0.015	0.140	0.200	0.200	72
4	-0.072	-0.465	-0.465	-0.394	-0.123	-0.029	0.009	0.163	0.272	0.272	72
Total	-0.074	-0.465	-0.464	-0.394	-0.124	-0.033	0.011	0.148	0.237	0.272	288

Estimates by Specification Tables 10, 29 and 30 show the estimates for the six different specifications discussed above, again using the percentile transformations of the variables.

For net income in Table 10, most estimates with specification (1) are negative. As discussed above this reflects the fact that large banks with high net income are listed. There is no clear pattern among the other specifications that include bank fixed effects. The estimates for specifications (2)-(5) are roughly centered around zero.

For ROE and ROA in Tables 29 and 30 the distributions for all specifications are centered around zero. However, in both cases the range of estimates for specification (1) is substantially smaller than for the other specifications.

Table 10: **Distribution of Net Income Percentile Estimates by Specification.** The rows of this table correspond to the six colmuns of the regression specifications in Table 16.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.289	-0.465	-0.465	-0.464	-0.406	-0.338	-0.183	0.009	0.009	0.009	48
2	-0.058	-0.238	-0.238	-0.208	-0.087	-0.065	-0.027	0.202	0.272	0.272	48
3	-0.022	-0.184	-0.184	-0.165	-0.048	-0.035	0.003	0.148	0.193	0.193	48
4	-0.047	-0.345	-0.345	-0.310	-0.070	-0.013	0.013	0.037	0.039	0.039	48
5	0.007	-0.333	-0.333	-0.297	-0.023	0.025	0.078	0.160	0.163	0.163	48
6	-0.039	-0.340	-0.340	-0.298	-0.109	-0.018	0.017	0.192	0.237	0.237	48
Total	-0.074	-0.465	-0.464	-0.394	-0.124	-0.033	0.011	0.148	0.237	0.272	288

Tables 11, 31 and 32 show the estimates that are statistically significant (at the one percent level) by specification.

For net income, in Table 11, all statistically significant estimates for specifications (1)-(3) are negative, and more than 75 percent of the estimates for specification (4) are negative. The estimates for specifications (5) and (6) are roughly centered around zero. Hence, the estimates from specifications that control for bank size show somewhat more support for the hypothesis that higher "Ownweight" is associated with higher profits.

For ROE in Table 31, specification (1) produces mostly negative estimates whereas the estimates for the other specifications are centered around zero.

For ROA in Table 32, specification (2) produces mostly negative estimates whereas the estimates for the other specifications are centered around zero.

Table 11: **Distribution of Statistically Significant (1 percent level) Net Income Percentile Estimates by Specification.** The rows of this table correspond to the six colmuns of the regression specifications in Table 16.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.316	-0.465	-0.465	-0.464	-0.414	-0.357	-0.237	-0.021	-0.021	-0.021	44
2	-0.097	-0.238	-0.238	-0.236	-0.103	-0.084	-0.058	-0.027	-0.027	-0.027	24
3	-0.078	-0.184	-0.184	-0.184	-0.083	-0.054	-0.046	-0.041	-0.041	-0.041	20
4	-0.098	-0.345	-0.345	-0.345	-0.135	-0.061	-0.030	0.039	0.039	0.039	20
5	-0.046	-0.333	-0.333	-0.332	-0.087	0.001	0.045	0.084	0.086	0.086	24
6	-0.108	-0.340	-0.340	-0.340	-0.222	-0.068	0.011	0.041	0.041	0.041	16
Total	-0.152	-0.465	-0.465	-0.436	-0.310	-0.085	-0.030	0.043	0.084	0.086	148

6 Direct Shareholders and Active Investors

In this section we estimate the effect of common ownership on bank profits if only common ownership through certain shareholders is taken into consideration. Specifically, we recalculate the profit weights under two alternative assumptions. First, if only common ownership by "Direct Shareholders" is taken into consideration, and second if only common ownership through "Active Investors" is taken into consideration.

"Direct Shareholders" are the ultimate owners of the shares as opposed to asset managers that manage shares that are ultimately owned by their clients. The idea is that "Direct Shareholders" benefit more from increasing share prices (as a consequence of decreased competition) than asset managers. For example Berkshire Hathaway owns shares of several banks and is a "Direct Shareholder". Vanguard also owns shares of many banks but is an asset manager that charges their clients a small percentage p of assets under management. If the shares held by Berkshire and Vanguard gain \$100 in value then Berkshire's profits increase by \$100 whereas Vanguard's profit increase only by $p \times \$100$. As p is typically fairly small for many asset managers, direct shareholders may have a much stronger incentive to prevent competition among their portfolio firms than asset managers.

"Active Investors" are those that do not simply replicate an index. The idea is that index funds compete mostly on fees. It is unclear how strong the incentives of an index fund manager are to reduce competition among portfolio firms, given that improved performance of the index would also improve the performance of all all competing index fund managers, which replicate the same index. Active asset managers however, who

hold a unique portfolio, could outperform other active asset managers if their portfolio firms compete less and thereby attract new clients.

When calculating profit weights with "Direct Shareholders" we only include ownership shares by Berkshire Hathaway and the Norwegian Sovereign Wealth fund. There are other direct shareholders that file the 13F besides these two. However among the largest 13F filers, that have the largest impact on the profit weights these are the only ones that can be viewed as "Direct Shareholders". One could argue that the Norwegian Sovereign Wealth fund should be treated as an asset manager. By treating it as a "Direct Shareholder" we implicitly assume that its incentives are aligned with the incentives of the Norwegians.

When calculating the profit weights with "Active Investors" we include the ownership shares of the active investors among the largest 20 institutional investors in the banking sector. Many asset managers have some funds that are actively managed and others that are passively managed. Therefore such a binary classification involves some judgment. Moreover, there are many smaller "Active Investors" that we do not take into account. However, the largest ones we do take into account have the largest impact on the profit weights.

Table 12 shows the distribution of point estimates if only ownership by "Direct Shareholders" is taken into account. Perhaps surprisingly, the estimates are still roughly centered around zero and the distributions of estimates appears to be broadly similar to the distributions of estimates if all ownership shares are taken into account.

Table 13 shows the distribution of point estimates if only ownership by "Active Investors" is taken into account. Again, the distribution of point estimates is centered around zero, but the range of estimates appears to be somewhat smaller than if all ownership shares are taken into account.

Tables 33 and 34 show the distributions of statistically significant estimates for "Direct Shareholders" and "Active Investors". The distributions are either centered around zero or have most of their mass on negative estimates. The largest positive estimates with "Direct Shareholders" for the Net Income Percentile and the ROE Percentile are however larger than if all ownership shares are taken into account.

Table 12: **Direct Shareholders: Distribution of Point Estimates**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
Net Income	-0.654	-9.257	-9.257	-7.424	-1.313	-0.004	0.976	2.169	2.364	2.364	72
Net Income Percentile	-0.056	-0.645	-0.645	-0.495	-0.085	-0.006	0.038	0.100	0.112	0.112	72
Return on Equity	-0.014	-0.088	-0.088	-0.066	-0.039	-0.016	0.014	0.043	0.047	0.047	72
Return on Equity Percentile	-0.012	-0.226	-0.226	-0.128	-0.065	-0.010	0.030	0.124	0.135	0.135	72
Return on Assets	-0.002	-0.008	-0.008	-0.006	-0.004	-0.002	0.001	0.003	0.004	0.004	72
Return on Assets Percentile	-0.005	-0.153	-0.153	-0.136	-0.048	-0.000	0.041	0.100	0.125	0.125	72

Table 13: **Active Investors: Distribution of Point Estimates**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
Net Income	-0.459	-3.895	-3.895	-2.161	-0.526	-0.208	-0.054	0.014	0.120	0.120	72
Net Income Percentile	-0.045	-0.476	-0.476	-0.432	-0.018	-0.008	0.020	0.035	0.058	0.058	72
Return on Equity	-0.003	-0.053	-0.053	-0.042	-0.012	-0.002	0.006	0.019	0.054	0.054	72
Return on Equity Percentile	-0.022	-0.170	-0.170	-0.113	-0.036	-0.013	0.004	0.014	0.061	0.061	72
Return on Assets	0.001	-0.004	-0.004	-0.002	-0.001	0.000	0.001	0.004	0.006	0.006	72
Return on Assets Percentile	-0.016	-0.155	-0.155	-0.075	-0.036	-0.014	0.009	0.028	0.081	0.081	72

7 Conclusion

Theory predicts that common ownership can be anticompetitive, because it reduces the weight firms place in their objective function on their own profits and instead shifts weight on rival firms that are held by a common shareholder. We estimate the effect of the predicted profit weight shifts due to common ownership on accounting measures of profitability in the banking industry. We present a large range of estimates that are centered around zero and argue that economically most estimates are fairly small. Our interpretation of these findings is that there is little evidence for economically large effects of common ownership on profits in the banking industry.

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A Tables

Table 14: **ROE**

	(1)	(2)	(3)	(4)	(5)	(6)
Weight on Own Profits	0.00119	0.0157**	0.0192**	0.0175*	0.0316***	0.0287***
	(0.00514)	(0.00518)	(0.00649)	(0.00760)	(0.00703)	(0.00727)
Total Weight Received from Rivals			0.00464	0.00908	0.00919	0.00370
			(0.00460)	(0.00620)	(0.00624)	(0.00474)
13F Ownership Share				-1.990	-5.253*	5.117*
				(2.297)	(2.568)	(2.142)
log(Total Assets)					5.011***	
					(0.543)	
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	No
Bank Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Asset Decile x Quarter Fixed Effects	No	No	No	No	No	Yes
N	401341	401229	401229	401229	401229	401229

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 15: **ROA**

	(1)	(2)	(3)	(4)	(5)	(6)
Weight on Own Profits	0.00118*	-0.000113	0.00108	0.00141*	0.00274***	0.00225**
	(0.000460)	(0.000456)	(0.000601)	(0.000706)	(0.000661)	(0.000685)
Total Weight Received from Rivals			0.00160**	0.000671	0.000770	0.000467
			(0.000558)	(0.000712)	(0.000721)	(0.000574)
13F Ownership Share				0.399	0.0858	0.857**
				(0.230)	(0.255)	(0.251)
log(Total Assets)					0.473***	
					(0.0487)	
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	No
Bank Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Asset Decile x Quarter Fixed Effects	No	No	No	No	No	Yes
N	401341	401229	401229	401229	401229	401229

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16: **Net Income Percentile**

	(1)	(2)	(3)	(4)	(5)	(6)
Weight on Own Profits	-0.340***	-0.0584***	-0.0414***	-0.0295**	0.0237**	0.0177*
	(0.0145)	(0.0103)	(0.00856)	(0.00924)	(0.00773)	(0.00718)
Total Weight Received from Rivals			0.0228***	-0.0102	-0.00620	0.00289
			(0.00644)	(0.0169)	(0.0170)	(0.00932)
13F Ownership Share				14.18*	1.559	19.60***
				(5.787)	(6.416)	(3.815)
log(Total Assets)					19.05***	
					(0.897)	
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	No
Bank Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Asset Decile x Quarter Fixed Effects	No	No	No	No	No	Yes
N	401341	401229	401229	401229	401229	401229

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17: **ROE Percentile**

	(1)	(2)	(3)	(4)	(5)	(6)
Weight on Own Profits	-0.0349***	0.0213**	0.00469	-0.00861	0.0281***	0.0202**
	(0.00992)	(0.00719)	(0.00714)	(0.00771)	(0.00705)	(0.00633)
Total Weight Received from Rivals			-0.0222***	0.0147	0.0175	0.00283
			(0.00507)	(0.0112)	(0.0114)	(0.00758)
13F Ownership Share				-15.91***	-24.62***	-1.669
				(4.114)	(4.512)	(2.601)
log(Total Assets)					13.14***	
					(0.789)	
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	No
Bank Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Asset Decile x Quarter Fixed Effects	No	No	No	No	No	Yes
N	401341	401229	401229	401229	401229	401229

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 18: **ROA Percentile**

	(1)	(2)	(3)	(4)	(5)	(6)
Weight on Own Profits	0.00810	-0.0189**	-0.0109	-0.00845	0.0204***	0.0121*
	(0.00730)	(0.00634)	(0.00575)	(0.00601)	(0.00587)	(0.00549)
Total Weight Received from Rivals			0.0107*	0.00394	0.00609	0.00307
			(0.00477)	(0.0102)	(0.0104)	(0.00715)
13F Ownership Share				2.904	-3.931	9.597***
				(3.360)	(3.718)	(2.291)
log(Total Assets)					10.31***	
					(0.605)	
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	No
Bank Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Asset Decile x Quarter Fixed Effects	No	No	No	No	No	Yes
N	401341	401229	401229	401229	401229	401229

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 19: **Distribution of ROE Percentile Estimates by Subsample**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	0.005	-0.035	-0.035	-0.035	-0.008	0.014	0.021	0.028	0.029	0.029	24
2	-0.037	-0.168	-0.168	-0.151	-0.041	-0.020	-0.008	0.042	0.046	0.046	24
3	-0.020	-0.098	-0.098	-0.098	-0.018	-0.009	0.006	0.009	0.009	0.009	24
4	0.048	0.027	0.027	0.028	0.032	0.036	0.071	0.083	0.084	0.084	24
5	0.012	-0.011	-0.011	-0.011	-0.009	0.014	0.026	0.037	0.038	0.038	24
6	-0.046	-0.235	-0.235	-0.234	-0.098	-0.052	0.023	0.097	0.100	0.100	24
7	-0.358	-0.439	-0.439	-0.438	-0.407	-0.349	-0.311	-0.261	-0.260	-0.260	24
8	-0.009	-0.155	-0.155	-0.155	-0.055	0.022	0.040	0.081	0.083	0.083	24
9	-0.065	-0.155	-0.155	-0.152	-0.135	-0.102	0.017	0.079	0.079	0.079	24
10	0.368	-0.041	-0.041	-0.041	0.400	0.436	0.469	0.534	0.536	0.536	24
11	0.024	0.018	0.018	0.018	0.021	0.024	0.025	0.035	0.035	0.035	24
12	-0.069	-0.186	-0.186	-0.186	-0.106	-0.051	-0.018	0.002	0.002	0.002	24
Total	-0.012	-0.439	-0.436	-0.338	-0.071	-0.002	0.028	0.411	0.494	0.536	288

Table 20: **Distribution of ROA Percentile Estimates by Subsample**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	0.000	-0.019	-0.019	-0.019	-0.010	0.000	0.012	0.020	0.021	0.021	24
2	-0.058	-0.208	-0.208	-0.187	-0.066	-0.041	-0.019	0.004	0.012	0.012	24
3	-0.024	-0.047	-0.047	-0.047	-0.027	-0.024	-0.013	-0.009	-0.009	-0.009	24
4	0.022	-0.004	-0.004	-0.004	0.004	0.006	0.012	0.106	0.106	0.106	24
5	0.002	-0.032	-0.032	-0.031	-0.006	0.006	0.017	0.022	0.023	0.023	24
6	-0.071	-0.200	-0.200	-0.200	-0.121	-0.051	-0.033	0.043	0.043	0.043	24
7	-0.327	-0.413	-0.413	-0.413	-0.397	-0.315	-0.299	-0.222	-0.222	-0.222	24
8	0.083	-0.080	-0.080	-0.080	0.066	0.119	0.126	0.150	0.152	0.152	24
9	-0.025	-0.109	-0.109	-0.108	-0.103	-0.038	0.035	0.107	0.107	0.107	24
10	0.262	-0.056	-0.056	-0.056	0.259	0.305	0.361	0.410	0.412	0.412	24
11	0.025	-0.004	-0.004	-0.004	0.023	0.029	0.030	0.044	0.044	0.044	24
12	-0.078	-0.174	-0.174	-0.173	-0.087	-0.074	-0.056	-0.001	-0.001	-0.001	24
Total	-0.016	-0.413	-0.406	-0.308	-0.058	-0.009	0.023	0.286	0.385	0.412	288

Table 21: **Distribution of Net Income Percentile Standard Errors by Subsample**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	0.010	0.007	0.007	0.007	0.008	0.009	0.010	0.014	0.014	0.014	24
2	0.023	0.016	0.016	0.016	0.018	0.023	0.028	0.030	0.034	0.034	24
3	0.006	0.003	0.003	0.003	0.005	0.006	0.007	0.009	0.009	0.009	24
4	0.027	0.024	0.024	0.024	0.025	0.026	0.027	0.031	0.031	0.031	24
5	0.014	0.010	0.010	0.010	0.013	0.014	0.015	0.015	0.015	0.015	24
6	0.061	0.011	0.011	0.011	0.053	0.071	0.077	0.084	0.084	0.084	24
7	0.063	0.054	0.054	0.054	0.055	0.063	0.071	0.078	0.078	0.078	24
8	0.014	0.002	0.002	0.002	0.013	0.015	0.017	0.021	0.021	0.021	24
9	0.303	0.024	0.024	0.024	0.333	0.354	0.370	0.385	0.389	0.389	24
10	0.234	0.007	0.007	0.007	0.255	0.276	0.286	0.315	0.315	0.315	24
11	0.008	0.007	0.007	0.007	0.007	0.008	0.009	0.009	0.009	0.009	24
12	0.081	0.003	0.003	0.003	0.088	0.096	0.100	0.105	0.105	0.105	24
Total	0.070	0.002	0.002	0.005	0.009	0.023	0.074	0.348	0.381	0.389	288

Table 22: **Distribution of ROE Percentile Standard Errors by Subsample**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	0.006	0.005	0.005	0.005	0.005	0.007	0.007	0.008	0.008	0.008	24
2	0.022	0.015	0.015	0.016	0.020	0.021	0.025	0.027	0.028	0.028	24
3	0.005	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.005	24
4	0.027	0.011	0.011	0.011	0.028	0.029	0.031	0.035	0.035	0.035	24
5	0.006	0.001	0.001	0.001	0.006	0.007	0.008	0.008	0.008	0.008	24
6	0.039	0.004	0.004	0.004	0.044	0.045	0.048	0.049	0.049	0.049	24
7	0.050	0.033	0.033	0.033	0.046	0.051	0.055	0.060	0.060	0.060	24
8	0.018	0.004	0.004	0.004	0.014	0.020	0.023	0.024	0.024	0.024	24
9	0.231	0.008	0.008	0.008	0.251	0.265	0.290	0.304	0.304	0.304	24
10	0.129	0.003	0.003	0.003	0.144	0.152	0.158	0.172	0.172	0.172	24
11	0.006	0.004	0.004	0.004	0.004	0.008	0.008	0.009	0.009	0.009	24
12	0.069	0.003	0.003	0.003	0.081	0.082	0.084	0.085	0.086	0.086	24
Total	0.051	0.001	0.001	0.004	0.007	0.021	0.051	0.254	0.298	0.304	288

Table 23: **Distribution of ROA Percentile Standard Errors by Subsample**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	0.006	0.005	0.005	0.005	0.006	0.006	0.006	0.007	0.007	0.007	24
2	0.021	0.018	0.018	0.018	0.019	0.021	0.023	0.026	0.030	0.030	24
3	0.007	0.006	0.006	0.006	0.006	0.007	0.008	0.009	0.009	0.009	24
4	0.026	0.010	0.010	0.010	0.029	0.029	0.030	0.030	0.030	0.030	24
5	0.011	0.005	0.005	0.005	0.011	0.013	0.013	0.014	0.014	0.014	24
6	0.053	0.006	0.006	0.006	0.058	0.060	0.066	0.071	0.071	0.071	24
7	0.068	0.047	0.047	0.047	0.061	0.068	0.077	0.083	0.083	0.083	24
8	0.037	0.006	0.006	0.006	0.037	0.041	0.042	0.057	0.057	0.057	24
9	0.102	0.012	0.012	0.012	0.112	0.117	0.124	0.132	0.132	0.132	24
10	0.180	0.006	0.006	0.006	0.208	0.212	0.217	0.224	0.225	0.225	24
11	0.007	0.005	0.005	0.005	0.006	0.008	0.008	0.008	0.008	0.008	24
12	0.072	0.004	0.004	0.004	0.084	0.085	0.086	0.088	0.089	0.089	24
Total	0.049	0.004	0.004	0.006	0.008	0.028	0.071	0.211	0.220	0.225	288

Table 24: **Distribution of Statistically Significant (1 percent level) Net Income Percentile Estimates by Subsample.** Missing subsamples have no statistically significant estimates.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.089	-0.340	-0.340	-0.339	-0.059	-0.042	-0.030	0.024	0.024	0.024	20
2	-0.132	-0.317	-0.317	-0.316	-0.132	-0.113	-0.079	-0.049	-0.045	-0.045	22
3	-0.106	-0.398	-0.398	-0.397	-0.084	-0.061	-0.020	-0.018	-0.017	-0.017	24
4	-0.129	-0.129	-0.129	-0.129	-0.129	-0.129	-0.128	-0.128	-0.128	-0.128	4
5	-0.170	-0.377	-0.377	-0.377	-0.375	-0.087	-0.048	-0.047	-0.047	-0.047	12
6	-0.326	-0.415	-0.415	-0.415	-0.415	-0.414	-0.149	-0.148	-0.148	-0.148	6
7	-0.285	-0.385	-0.385	-0.383	-0.336	-0.303	-0.222	-0.165	-0.165	-0.165	24
8	-0.193	-0.465	-0.465	-0.465	-0.464	-0.196	0.078	0.086	0.086	0.086	8
9	-0.237	-0.237	-0.237	-0.237	-0.237	-0.237	-0.237	-0.237	-0.237	-0.237	4
10	-0.437	-0.437	-0.437	-0.437	-0.437	-0.437	-0.437	-0.436	-0.436	-0.436	4
11	0.024	-0.027	-0.027	-0.027	0.005	0.039	0.042	0.046	0.046	0.046	16
12	-0.021	-0.021	-0.021	-0.021	-0.021	-0.021	-0.021	-0.021	-0.021	-0.021	4
Total	-0.152	-0.465	-0.465	-0.436	-0.310	-0.085	-0.030	0.043	0.084	0.086	148

Table 25: **Distribution of Statistically Significant (1 percent level) ROE Percentile Estimates by Subsample.** Missing subsamples have no statistically significant estimates.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	0.009	-0.035	-0.035	-0.035	-0.007	0.021	0.024	0.029	0.029	0.029	16
2	-0.151	-0.168	-0.168	-0.168	-0.159	-0.149	-0.142	-0.137	-0.137	-0.137	4
3	-0.097	-0.098	-0.098	-0.098	-0.098	-0.097	-0.097	-0.097	-0.097	-0.097	4
4	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.084	0.084	0.084	4
5	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	0.037	1
6	-0.139	-0.235	-0.235	-0.235	-0.193	-0.118	-0.085	-0.085	-0.085	-0.085	8
7	-0.358	-0.439	-0.439	-0.438	-0.407	-0.349	-0.311	-0.261	-0.260	-0.260	24
8	-0.155	-0.155	-0.155	-0.155	-0.155	-0.155	-0.155	-0.155	-0.155	-0.155	4
10	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	4
11	0.025	0.018	0.018	0.018	0.021	0.024	0.026	0.035	0.035	0.035	22
Total	-0.115	-0.439	-0.439	-0.413	-0.261	-0.041	0.023	0.037	0.084	0.084	91

Table 26: **Distribution of Statistically Significant (1 percent level) ROA Percentile Estimates by Subsample.** Missing subsamples have no statistically significant estimates.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	0.000	-0.019	-0.019	-0.019	-0.019	0.000	0.020	0.021	0.021	0.021	8
2	-0.126	-0.208	-0.208	-0.208	-0.184	-0.122	-0.066	-0.061	-0.061	-0.061	8
3	-0.030	-0.047	-0.047	-0.047	-0.037	-0.026	-0.024	-0.023	-0.023	-0.023	16
4	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	4
5	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032	-0.031	-0.031	-0.031	-0.031	2
6	-0.101	-0.200	-0.200	-0.200	-0.200	-0.051	-0.051	-0.051	-0.051	-0.051	6
7	-0.327	-0.413	-0.413	-0.413	-0.397	-0.315	-0.299	-0.222	-0.222	-0.222	24
8	0.087	-0.080	-0.080	-0.080	0.113	0.122	0.128	0.151	0.152	0.152	20
10	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	4
11	0.031	0.022	0.022	0.022	0.028	0.030	0.031	0.044	0.044	0.044	20
Total	-0.066	-0.413	-0.413	-0.401	-0.184	-0.026	0.030	0.127	0.150	0.152	112

Table 27: **Distribution of ROE Percentile Estimates by Profit Weight Calculation.** The rows of this table correspond to the rows of Table 3.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.002	-0.344	-0.344	-0.309	-0.065	0.002	0.034	0.446	0.534	0.534	72
2	-0.022	-0.438	-0.438	-0.399	-0.079	-0.007	0.027	0.408	0.482	0.482	72
3	-0.020	-0.439	-0.439	-0.402	-0.082	-0.004	0.030	0.406	0.481	0.481	72
4	-0.004	-0.344	-0.344	-0.307	-0.066	-0.000	0.028	0.448	0.536	0.536	72
Total	-0.012	-0.439	-0.436	-0.338	-0.071	-0.002	0.028	0.411	0.494	0.536	288

Table 28: **Distribution of ROA Percentile Estimates by Profit Weight Calculation.** The rows of this table correspond to the rows of Table 3.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.004	-0.323	-0.323	-0.298	-0.053	-0.007	0.025	0.351	0.410	0.410	72
2	-0.027	-0.413	-0.413	-0.394	-0.070	-0.012	0.023	0.269	0.313	0.313	72
3	-0.024	-0.413	-0.413	-0.394	-0.060	-0.008	0.022	0.270	0.311	0.311	72
4	-0.006	-0.322	-0.322	-0.298	-0.056	-0.010	0.026	0.350	0.412	0.412	72
Total	-0.016	-0.413	-0.406	-0.308	-0.058	-0.009	0.023	0.286	0.385	0.412	288

Table 29: **Distribution of ROE Percentile Estimates by Specification.** The rows of this table correspond to the six colmuns of the regression specifications in Table 17.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.071	-0.436	-0.436	-0.344	-0.118	-0.038	0.003	0.083	0.084	0.084	48
2	0.008	-0.413	-0.413	-0.313	-0.020	0.018	0.071	0.408	0.448	0.448	48
3	-0.014	-0.439	-0.439	-0.338	-0.089	0.002	0.022	0.393	0.435	0.435	48
4	-0.009	-0.392	-0.392	-0.300	-0.060	-0.008	0.026	0.411	0.457	0.457	48
5	0.025	-0.402	-0.402	-0.309	-0.007	0.025	0.040	0.482	0.536	0.536	48
6	-0.013	-0.356	-0.356	-0.261	-0.105	0.008	0.026	0.438	0.494	0.494	48
Total	-0.012	-0.439	-0.436	-0.338	-0.071	-0.002	0.028	0.411	0.494	0.536	288

Table 30: **Distribution of ROA Percentile Estimates by Specification.** The rows of this table correspond to the six colmuns of the regression specifications in Table 18.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.046	-0.394	-0.394	-0.298	-0.068	-0.012	0.022	0.106	0.106	0.106	48
2	-0.010	-0.315	-0.315	-0.223	-0.047	-0.019	0.050	0.248	0.322	0.322	48
3	-0.003	-0.308	-0.308	-0.222	-0.027	-0.010	0.011	0.270	0.351	0.351	48
4	-0.016	-0.406	-0.406	-0.316	-0.087	-0.014	0.025	0.298	0.385	0.385	48
5	0.002	-0.413	-0.413	-0.323	-0.054	0.012	0.030	0.286	0.371	0.371	48
6	-0.020	-0.401	-0.401	-0.301	-0.091	0.006	0.023	0.313	0.412	0.412	48
Total	-0.016	-0.413	-0.406	-0.308	-0.058	-0.009	0.023	0.286	0.385	0.412	288

Table 31: **Distribution of Statistically Significant (1 percent level) ROE Percentile Estimates by Specification.** The rows of this table correspond to the six colmuns of the regression specifications in Table 17.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.093	-0.436	-0.436	-0.435	-0.153	-0.085	-0.034	0.083	0.084	0.084	36
2	-0.108	-0.413	-0.413	-0.413	-0.313	0.018	0.020	0.021	0.021	0.021	12
3	-0.183	-0.439	-0.439	-0.439	-0.388	-0.158	0.022	0.024	0.024	0.024	8
4	-0.223	-0.392	-0.392	-0.392	-0.390	-0.299	0.021	0.023	0.023	0.023	6
5	-0.090	-0.402	-0.402	-0.402	-0.307	0.025	0.028	0.037	0.037	0.037	13
6	-0.114	-0.356	-0.356	-0.356	-0.247	-0.065	0.022	0.026	0.026	0.026	16
Total	-0.115	-0.439	-0.439	-0.413	-0.261	-0.041	0.023	0.037	0.084	0.084	91

Table 32: **Distribution of Statistically Significant (1 percent level) ROA Percentile Estimates by Specification.** The rows of this table correspond to the six colmuns of the regression specifications in Table 18.

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
1	-0.074	-0.394	-0.394	-0.394	-0.126	-0.053	0.010	0.106	0.106	0.106	32
2	-0.052	-0.315	-0.315	-0.315	-0.061	-0.032	-0.019	0.123	0.123	0.123	19
3	-0.037	-0.308	-0.308	-0.308	-0.124	-0.000	0.070	0.122	0.122	0.122	16
4	-0.059	-0.406	-0.406	-0.406	-0.072	-0.025	0.030	0.130	0.130	0.130	17
5	-0.043	-0.413	-0.413	-0.413	-0.068	0.021	0.031	0.152	0.152	0.152	17
6	-0.159	-0.401	-0.401	-0.401	-0.301	-0.200	0.029	0.030	0.030	0.030	11
Total	-0.066	-0.413	-0.413	-0.401	-0.184	-0.026	0.030	0.127	0.150	0.152	112

Table 33: **Direct Shareholders: Distribution of Statistically Significant (1 percent level) Point Estimates.**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
Net Income	-2.596	-9.257	-9.257	-9.257	-7.424	-3.847	2.169	2.364	2.364	2.364	15
Net Income Percentile	-0.100	-0.645	-0.645	-0.614	-0.211	0.033	0.081	0.110	0.112	0.112	34
Return on Equity	-0.033	-0.088	-0.088	-0.088	-0.065	-0.044	-0.036	0.047	0.047	0.047	18
Return on Equity Percentile	-0.015	-0.226	-0.226	-0.191	-0.092	-0.036	0.080	0.134	0.135	0.135	35
Return on Assets	-0.004	-0.008	-0.008	-0.008	-0.006	-0.004	-0.003	0.004	0.004	0.004	19
Return on Assets Percentile	-0.000	-0.153	-0.153	-0.151	-0.071	0.056	0.078	0.124	0.125	0.125	29

Table 34: **Active Investors: Distribution of Statistically Significant (1 percent level) Point Estimates.**

	Mean	Min	P1	P5	P25	Median	P75	P95	P99	Max	N
Net Income	-0.862	-3.895	-3.895	-2.946	-1.396	-0.396	-0.061	0.015	0.017	0.017	24
Net Income Percentile	-0.139	-0.476	-0.476	-0.468	-0.317	-0.038	0.027	0.043	0.058	0.058	24
Return on Equity	-0.015	-0.053	-0.053	-0.053	-0.028	-0.015	-0.010	0.054	0.054	0.054	19
Return on Equity Percentile	-0.053	-0.170	-0.170	-0.142	-0.056	-0.038	-0.029	-0.020	0.061	0.061	25
Return on Assets	-0.000	-0.004	-0.004	-0.004	-0.002	-0.001	0.002	0.004	0.006	0.006	20
Return on Assets Percentile	-0.042	-0.155	-0.155	-0.130	-0.048	-0.036	-0.024	0.019	0.081	0.081	28

B Data

To be added.