Ownership concentration and market liquidity: Evidence from a natural experiment

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HIGHLIGHTS

- We study the effects of institutional ownership concentration on market liquidity.
- We use M&A activity among pension fund managers as a natural experiment.
- Higher ownership concentration negatively affects turnover and bid-ask spreads.

ARTICLE INFO

ABSTRACT

Using the merger and acquisition activity among pension fund management companies as a natural experiment, we obtain estimates on the causal link between ownership concentration and secondary market liquidity. Our findings suggest that concentrated ownership structures, via the threat of informed trading, adversely affects stock trading activity.

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1. Introduction

Institutional investors have become the majority owners of most large corporations and are expected to play a key role for financial development by providing funding for firms, enhancing market liquidity through more active trading, and by promoting better corporate governance in the companies in which they invest (e.g., Ferreira and Matos, 2008; Aggarwal et al., 2011). In developing countries, however, a small number of institutional investors (and sometimes only a single one) often hold substantial stakes in publicly-traded companies (World Bank, 2015). In settings where ownership is concentrated, there might be less incentives to foster transparency, leading to weak investor protection and greater agency costs for minority shareholders. Consequently, outside investors might be discouraged to participate in these markets, thereby, deteriorating secondary market liquidity.

In this paper, we investigate the effects of institutional ownership concentration on market liquidity. Understanding this link is important because of its direct implications for asset pricing and corporate governance (e.g. Brennan and Subrahmanyam, 1996; Amihud, 2002). However, estimating the casual effects from concentration on liquidity is difficult because of reverse causality and omitted variable bias. To overcome these issues, we use a natural experiment from the merger and acquisition (M&A) activity among pension fund managers in Colombia to test whether changes in ownership concentration impact trading activity and transaction costs. The Colombian setting is ideal to explore these issues because institutional investors are the dominant players in the domestic equity market. More importantly, the M&A deals among large asset management companies in the country generate sizable cross-sectional variation in ownership concentration among listed firms. Furthermore, these changes are independent from corporate policies that are known to affect liquidity directly. Overall, our results suggest that increases in institutional ownership, via the threat of informed trading, are adversely affecting liquidity in the stock market.

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2. Data

Data in this paper were collected from two sources. We use Compustat Global for daily stock prices and quarterly balance sheet information of listed companies in Colombia between January 2010 and December 2014. To avoid stocks with low trading activity, we restrict our sample to stocks that trade at least 25% of the business days when the stock was active. Our final sample includes 57 different stocks, which represent 93% of total stock market capitalization and 95% of the trading volume. Equity ownership information of each company is published quarterly by the *Superfinanciera de Colombia* (SFC),[1] e.g., names and holdings of the largest twenty shareholders, total institutional ownership, and total ownership by foreign investors.

3. Empirical methodology

We define ownership concentration for each stock s as the total ownership of the largest five shareholders ($CONC_{s,t}$). We use two measures of liquidity ($liq_{s,t}$) for each stock-quarter in the sample: (i) the natural log of turnover to capture trading activity, and (ii) the natural log of the stock's bid–ask spread to quantify transaction costs. The relation between liquidity and ownership concentration is commonly estimated as follows (Brockman et al., 2009):

$$liq_{s,t} = \alpha_s + \gamma_t + \beta CONC_{s,t-1} + X_{s,t-1}\phi + \varepsilon_{s,t} \qquad (1)$$

where α_s and γ_t are stock- and time-fixed effects to account for time-invariant stock characteristics and for aggregate trends in trading activity. $X_{s,t}$ are stock time-varying controls which include firm size, book-to-market ratio, leverage, returns over assets, institutional ownership, and foreign ownership (Table 1 describes each variable and presents summary statistics across stocks).

There are at least two shortcomings from estimating β in Eq. (1). First, if there are unobserved variables that affect ownership concentration and liquidity simultaneously, the coefficient of *CONC* would be biased. For example, changes in the expectations of corporate policy — leverage or dividend payouts — might influence how large shareholders trade the stock. Second, liquidity is likely endogenous to the firm's choice of ownership structure (Bolton et al., 1998). For instance, the proportion of shares issued in a public offering are the result from balancing the trade-offs between maintaining ownership control and the potential intervention from outsiders.

In order to overcome these identification issues, we use a natural experiment based on M&A deals among the largest type of institutional investor in the country, namely, pension fund management companies (AFP for their Spanish acronym).[2] These asset managers collect compulsory contributions by workers, manage the investment portfolio, and payout pension benefits. By December 2011, there were six AFPs operating in the country, with investments which represented 14% of the total stock market capitalization (each AFP investing in at least 30 different stocks). Moreover, during that year, AFPs trading activity accounted for over 12% of the total value traded in the stock market.[3]

In December 2012, Proteccion, the second largest AFP measured by assets under management, completed a merger with ING (4th largest AFP). The operation was part of a larger deal that included the asset management business of ING in Latin America. In the following December, BBVA-Horizonte sold its pensions management operation to Porvenir (the largest AFP in the country). This deal was also part of a broader strategy by the Spanish bank BBVA to sell its pension units in Mexico, Chile, Colombia, and Peru, in an effort to focus on its main banking businesses.[4]

Among the implications from these deals were the resulting increases in stock ownership concentration, particularly in listed companies in which both target and acquirer AFP had significant investments. For example, if the individual holdings of AFP i and j represent 5% of the shares outstanding of a company s, after the merger one single AFP would hold a 10% stake in s. Conversely, for stocks in which one or neither AFP have investments, there would be no changes in ownership concentration after the M&A deal. While the decision to acquire or to merge with a competing AFP is the result from a strategic business choice, we argue that cross-sectional changes in ownership concentration from these deals are exogenous to corporate decisions of publicly traded companies that might affect liquidity directly.

Our specific instrument is the ratio of common ownership in every stock between the AFPs involved in the M&A deals. We define common ownership as the geometric average between the holdings of the two funds in stock s ($H_{s,f1}$ and $H_{s,f2}$) one year before the deal was completed:[5]

$$FCAP_{s,k} = \left(H_{s,f1} * H_{s,f2}\right)^{1/2} \qquad (2)$$

where k is either 1 or 2, representing each deal. Our empirical methodology follows a *difference-in-difference* strategy by assessing whether changes in ownership concentration resulting from the M&A activity affect liquidity disproportionately in stocks with large common ownership. To be precise, our strategy is to compare changes in liquidity before and after the M&A deals across stocks with high *FCAP* vis-á-vis changes in liquidity over the same period for stocks with low common ownership.

Our specification can be represented in two stages. In the first stage, we estimate ownership concentration as follows:

$$CONC_{s,t} = \alpha_s + \gamma_t + \sum_{k=1,2}\beta_k d_k + \sum_{k=1,2}\lambda_k d_k \times FCAP_{s,k}$$
$$+ \sum_{k=1,2}\phi_k d_k \times X_{s,t} + \varepsilon_{s,t} \qquad (3)$$

where d_k is a dummy variable equal to zero before merger k, and equal to one thereafter. The coefficients λ_1 and λ_2 measure the average increase in concentration after the merger for every unit of common ownership.

In the second stage, we use the fitted ownership concentration ($\widehat{CONC}_{st}$) to estimate changes in the level of trading activity and bid–ask spread in Eq. (1). To account for direct effects on liquidity given the smaller number of AFPs in the market after the M&A deals, we use the following two controls: (i) the quarterly turnover of all pension funds in each stock during the sample period ($AFPT_{s,t}$), and (ii) the average trading activity in each stock for each of the exiting AFPs, i.e. for ING and BBVA-Horizonte.

4. Results

Table 2-Panel A reports the estimated coefficients of the first stage (3). We find that λ_1 and λ_2 are positive and highly statistically significant. To visually examine aggregate ownership dynamics during our sample period, we plot the time series of ownership concentration in Fig. 1 for two groups of stocks; those above and

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[1] Supervisory agency within Colombia's Finance and Public Credit Ministry which oversees all financial, insurance and pension services in the country.

[2] Administradoras de Fondos de Pensiones.

[3] Data from SFC. The other two large groups, domestic mutual funds and foreign institutions, accounted for less than 11% of the market capitalization during our sample period.

[4] "BBVA eyes sale of Latin American pension business", Wall Street Journal, May 24, 2012.

[5] Measuring holdings one-year before the deal avoids strategic trades in anticipation of the merger.

Table 1

Summary statistics. This table reports variable definitions and summary statistics. The last two columns include the average of each variable across stocks before December 2012 sorted by level of common ownership, *FCAP*.

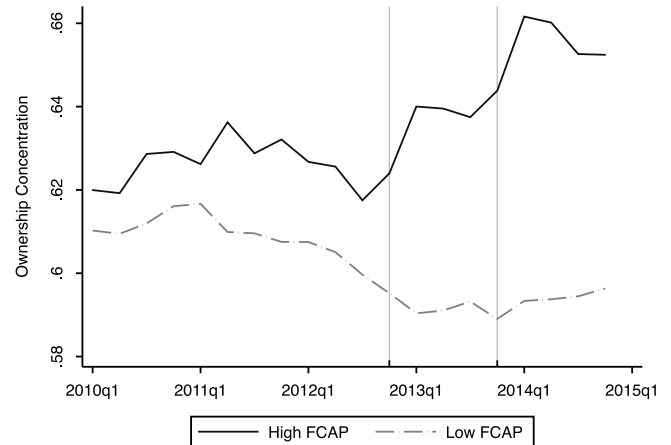| Variable	Definition	Mean	Std. Dev.	Min	Max	Mean by FCAP	
						Low	High
$SPREAD_{s,t}$	Average bid–ask spread: $(ask - bid)/(ask + bid)/2$	0.08	0.12	0.01	0.82	0.05	0.03
$TURNOVER_{s,t}$	Shares traded in a year divided by shares outstanding	0.11	0.34	0.01	4.13	0.13	0.12
$CONC_{s,t}$	Percentage of shares held by the largest 5 owners	0.62	0.27	0.03	0.99	0.60	0.62
$INST_{s,t}$	Percentage of shares held by domestic institutions	0.86	0.17	0	1	0.84	0.89
$FOREIGN_{s,t}$	Percentage of shares owned by foreign investors	0.22	0.33	0	1	0.18	0.12
$B/M_{s,t}$	Book-to-market ratio	1.27	1.84	0.14	18.01	1.18	0.99
$SIZE_{s,t}$	Log of firm's total assets	15.01	1.62	10.86	18.61	14.7	16.1
$ROA_{s,t}$	Return over assets	0.03	0.05	−0.54	0.32	0.03	0.03
$LEV_{s,t}$	Liabilities divided by assets	1.84	3.06	0.01	22.81	1.90	1.20
$FCAP_s$	Common ownership (%)	1.01	1.95	0.00	6.70	3.70	0.21

Table 2

Empirical results. This table reports 2SLS instrumental variable regression based on a natural experiment. Panel A presents estimates of ownership concentration (*CONC*). *FCAP* is the measure of common ownership among merging AFPs. d_1 and d_2 are dummy variables equal to one after each deal. Panel B presents second stage estimates of the natural log of turnover and bid–ask spread. *AFPT* is the quarterly trading activity of all active AFPs, measured as the shares traded during the period over shares outstanding for each stock. *ING* and *BBVA − Horizonte* measure average trading activity in each stock by the exiting AFPs. We report *t*-statistics in parentheses. Note: ***/**/* indicate that the coefficient estimates are significantly different from zero at the 1%/5%/10% level.

Panel A. First stage

	Ownership concentration			
	Turnover		Bid–Ask Spread	
	(A1)	(A2)	(A3)	(A4)
$d_1 \times FCAP_1$	0.737**	1.245***	0.560**	0.744***
	(1.96)	(4.31)	(2.47)	(4.48)
$d_2 \times FCAP_2$	3.708***	2.711***	3.199***	2.152***
	(8.00)	(5.33)	(6.68)	(6.27)
R^2	0.970	0.969	0.967	0.979

Panel B. Second stage

	Turnover		Bid–ask spread	
	(B1)	(B2)	(B3)	(B4)
CONC	−4.000**	−10.083***	3.403**	3.813***
	(−2.04)	(−4.31)	(2.42)	(2.63)
AFPT	0.186***		−0.159***	
	(4.31)		(−3.41)	
ING		519.598***		−75.061
		(5.83)		(−1.55)
BBVA-Horizonte		−65.542		−18.171
		(−0.64)		(−0.21)
Controls	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes
R^2	0.7261	0.7515	0.606	0.7586
N	1069	1069	1069	1069

Fig. 1. Time series of ownership concentration for stocks with high (solid) and low (dash) common ownership. Vertical solid lines represent each M&A deal.

Fig. 2. Estimated time series of turnover for stocks with high and low common ownership (FCAP). For each group, we present the estimated turnover in the absence of M&A activity.
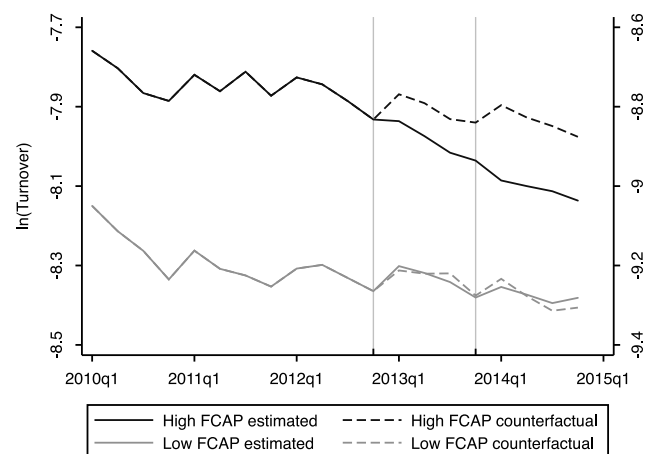
below the median of common ownership (*FCAP*). After each deal, there was an average increase of 1.8% in ownership concentration for the high *FCAP* group, while other stocks did not experience any substantial changes in concentration.

The first row of estimates in Table 2-Panel B corresponds to the 2SLS coefficients on instrumented *CONC*. In the case of turnover, the coefficient is −4.00, which is statistically significant with a t-statistic of 2.04. This causal effect is economically significant as well, i.e. a one percent increase in ownership concentration implies a 4.00% decrease in turnover. We also find that higher ownership concentration implies larger transaction costs —a one percent increase in concentration implies a 3.40% rise in the bid–ask spread.

The adverse liquidity effects are present after controlling for the actual trading activity in each stock by exiting funds and the total value traded by all active AFPs. These findings suggest that the negative effects from ownership concentration on liquidity

are not explained by a lesser amount of trading activity from a smaller number of pension funds in the market. In turn, alternative explanations of information frictions might be needed to explain our results. For example, market participants may internalize the changes in ownership concentration by adjusting the liquidity provision costs in order to protect against adversely selected trades — if AFPs gain access to inside information when they are among the largest shareholders in a firm (see for example Pedraza, forthcoming).

Fig. 2 displays the estimated logs of turnover for stocks in the high and low common ownership groups. The figure also displays the predicted measures of turnover assuming that neither one of the M&A deals were completed. According to the figure, stocks with high common ownership have more turnover on average than those with low common ownership. More importantly, while turnover has been consistently declining in the sample period for both groups of stocks, there is a significant additional decline after each M&A deal for stocks with large common ownership in our sample.

5. Conclusions

Our evidence indicates that the consolidation of the pension fund management industry in Colombia had detrimental effects for secondary market liquidity. More broadly, our study highlights an important limitation from the presence of institutional investors for financial development. If institutional investors exacerbate concentrated ownership structures, outside investors might limit their trading activity in these markets, thereby, negatively impacting liquidity and increasing the cost of capital for firms. Whether the benefits from economies of scale and scope from the presence of sophisticated investors outweigh the costs from increased ownership concentration should be analyzed further. We suspect that similar estimation strategies with M&A deals between asset managers could be used in other markets to estimate the effects from institutional ownership concentration. We leave these exercises for future work.

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