

How are stocks connected? Evidence from an emerging market

S.M. Aghajanzadeh* M. Heidari* M. Mohseni*

* Tehran Institute for Advanced Studies, Khatam University, Tehran, Iran

۲۹ آبان ۱۴۰۰

چکیده

We link stocks through direct and indirect common owners, and we show that having common ownership and belonging to a business group (indirect common owner) affect the co-movement. Our analysis is based on the daily ownership of blockholders on the Tehran Stock Exchange. The study found that belonging to a business group had more impact than being a common owner, and a common owner influenced only movement within business groups. In addition, co-movement in business groups is explained by simultaneous trades in the same direction.

Introduction ۱

The phenomenon of "co-movement" has been observed by researchers and analysts. There is an increase in interest in risk models, notably after the financial crisis of 2008. According to these models, price correlation plays a significant role in risk measurement. Companies' return co-movement was traditionally attributed to their fundamentals. (For example [Shiller \(1989\)](#))

Although, in recent years, it has been recognized that the co-movement rises from non-fundamental sources. [Barberis and Shleifer \(2003\)](#) and [Barberis et al. \(2005\)](#) provided theoretical models for predicting a co-movement between fundamentally unrelated companies. The following

are some of the other sources of co-movement. Index inclusion)[Barberis et al. \(2005\)](#),(investors' attention to the companies)[Wu and Shamsuddin \(2014\)](#),(Investment banks' underwriting)[Grullon et al. \(2014\)](#),(correlated beliefs)[David and Simonovska \(2016\)](#),(shareholders' coordination)[Pantzalis and Wang \(2017\)](#),(and preference for companies' dividends)[Hameed and Xie \(2019\)](#)(are among contributing factors to co-movement that have been identified by researchers.

Further more, [Anton and Polk \(2014\)](#) examined on the effect of common ownership on co-movement¹. This paper suggests that co-movement increases by increasing common ownership. Also, as the mutual fund ownership data was accessible to the author, it is shown in the paper that the co-movement increases when there is a significant net flow, either in or out-flow in the months.

In addition, according to [Koch et al. \(2016\)](#) companies show co-movement considering their owners' correlation in their liquidity needs. The author also adds that companies with higher mutual fund ownership have a more liquidity correlation than others. This paper contends that in order for companies to have co-movement, there is no need for common ownership. Plus, common ownership can explain companies' liquidity correlation.

According to the restriction of data in the US that only fund ownership data is available, investigations in this area are limited to the fund ownership impact on co-movement. This type of owners perform particular types of behavior due to their needs and the fact that they are intermediates. Nevertheless, in Iran, the block holders' daily ownership data, including mutual fund ownership, is publicly accessible. So research through this data can show whether common ownership other than mu-

¹The common ownership concept has been observed in financial literature in recent years. There has been a surge in the popularity of index investing in the United States, which has led to an increase in common ownership. For instance, [Azar et al. \(2018\)](#) claims that an increase in mutual ownership in airline companies leads to less competitive ticket pricing. However, this subject is controversial and many papers discuss whether mutual ownership affects companies' behavior. For example, [Lewellen and Lowry \(2021\)](#) realized that in previous investigations, other effective factors have wrongly been replaced by mutual ownership effect.

tual fund ownership can lead to co-movement or not.

Additionally, there are business groups with a share of almost 85% of the Iran stock market. Business groups are essential phenomena that can be seen in developed and developing countries. This paper analyzes co-movement in business groups. Two papers are found in the literature debate this subject, considering co-movement in business groups.

Although the co-movement in business groups is accepted, the co-movement channels remained undiscovered. Both [Cho and Mooney \(2015\)](#) and [Kim et al. \(2015\)](#) studied the South Korean market and suggested two different sources for the co-movement in business groups. The first paper attributed co-movement to the companies' fundamentals. However, the second paper presents that the investors' category/habitat behavior is responsible for co-movement.

In this paper, we consider the co-movement of the companies in business groups. Best of our knowledge, it is the first study that compares direct and indirect common ownership. A modified measurement is introduced in this paper to calculate the common ownership of the companies.

We realize that common ownership is crucial for predicting the co-movement. Business groups play a more critical role in predicting correlation of companies' return than common ownership. We show that common ownership can predict co-movement only inside the business groups.

We extend our analysis in order to validate the prominence of business groups. First, restrict the study to high level of common ownership for distinguishing effect of high level of common ownership and business groups. In this subset, like the mentioned ones, business groups have a significant impact. Second, if business group affect co-movement, there is no need to restrict our investigation to commonly hold pairs. In order to distinguish the impact of common ownership and business group, we built all possible pairs in the market. We show that for all the firms in the market, business group can increase firms' co-movement.

Finally, we show that correlated trade in business groups is the channel of co-movement. We provide evidence that the volume and direction of trades in business groups are related, and firms in the business groups with

higher relation in trade have a higher level of co-movement.

Data and Methodology ۲

Data and Sample ۱.۲

We use our unique data set, including the daily ownership table that reports all end-of-the-days block-holders of listed firms with their changes in that day. Block-holder is a shareholder who owns at least ۱% of the total shares outstanding. We also gathered industries index and stock returns, trading volume, and other relevant market and accounting data from the Codal website^۲ and the Tehran Securities Exchange Technology Management Co (TSETMC)^۳ database.

We exclude ETFs from our listed firms because it has a different return and ownership patterns compared to other firms in our study. We restrict our empirical analysis to ۱۳۹۸/۱۲-۱۳۹۳/۰۱)۲۰۲۰/۰۳-۲۰۱۵/۰۳ Persian calendar) due to the availability of daily ownership data and the special events^۴ that happened after ۲۰۲۰/۰۳ which may affect our results.

Business groups – groups of listed firms with interconnected ownership structures controlled by an ultimate common owner – are the principal organizational structure in many parts of the world. Business groups seem to be a central feature of corporate ownership in Iran. Most Iranian listed firms present in a complex interlinked shareholders' network that an ultimate owner governs this group through many layers of ownership. Aliabadi et al.)۲۰۲۱(We do not have pre-specified Iranian business groups despite other countries like South Korea, Japan, and India that their groups are announced formally. For defining business groups, we use data provided by Aliabadi et al.)۲۰۲۱(. They use Almeida et al.)۲۰۱۱(algorithm with a ۴۰% threshold for defining groups.

^۲www.codal.ir

^۳www.tsetmc.com

^۴ The Tehran Stock Exchange's main index (TEPIX) raised exponentially to quadruple value and then fell sharply due to the gigantic entrance of new individual investors that seems to be a bubble period from that period.

Table 1 reports summary statistics of ownership data and business groups. As shown in the table, 494 firms on average have five blockholders that own 73 percent of them. There are 43 business groups on average, with seven members which own 314 (73%) firms.

Table 1: This table reports summary statistics of ownership features for all the listed firms. At this table by group, we mean business groups.

Year	2014	2015	2016	2017	2018	2019
No. of Firms	365	376	447	552	587	618
No. of Blockholders	777	803	984	1297	1454	1458
No. of Groups	38	41	43	44	40	43
No. of Firms in Groups	249	268	300	336	346	375
Ave. Number of group Members	7	7	7	8	9	9
Ave. ownership of each Blockholders	21	22	22	21	22	23
Med. ownership of each Blockholders	7	8	8	8	8	9
Ave. Number of Owners	5	5	5	5	5	5
Ave. Block. Ownership	76	77	75	75	75	71

Pair composition 2.2

If two firms have at least one common block-holder, We consider them as a pair. By this definition, there are 9336 unique pairs in entire periods, which is 18% of possible pairs $596/2 * 596 = .(1779.6$ As we expected, stocks in pairs have concentrated ownership relative to the total sample, and pairs have one common owner.

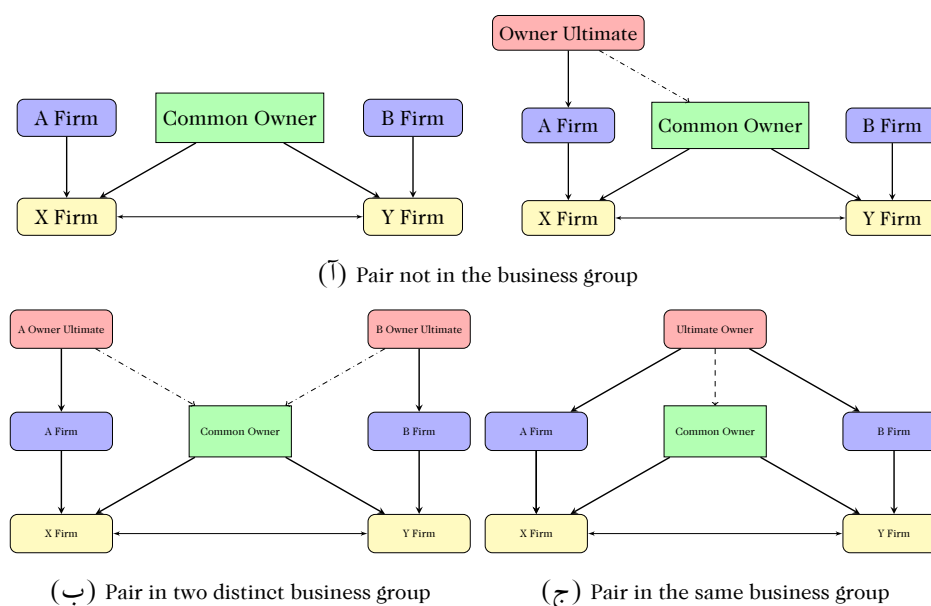
As one of our empirical studies, we study the impact of being in the same business group relative to being in two distinct groups on pair's correlation. (Further explanations about business groups are in section 3 (For assigning one pair to a group, both firms should belong to one ultimate owner. Another possibility is that each firm belongs to a different ultimate owner or one of them, or both of them do not belong to any groups, which all of them illustrated in figure 1. By classifying pairs, on average, 15% of them belong to one business group, and 74% of them are not in the same

Table :۲ This table reports summary statistics of ownership features for total pairs. At this table by group, we mean business groups.

Year	۲۰۱۴	۲۰۱۵	۲۰۱۶	۲۰۱۷	۲۰۱۸	۲۰۱۹
No. of Pairs	۲۰,۸۷۶	۲۱,۱۸۷	۲۷,۷۸۴	۴۱,۴۴۹	۴۷,۲۳۴	۶۷,۲۳۲
No. of Pairs not in Groups	۱۱,۴۵۲	۱۱,۱۹۲	۱۵,۳۵۱	۲۶,۵۳۰	۲۹,۱۸۲	۴۳,۴۳۳
No. of Pairs not in the same Group	۷,۹۶۲	۸,۷۳۱	۱۰,۹۷۱	۱۲,۹۱۶	۱۵,۳۶۶	۲۰,۷۴۵
No. of Pairs in the same Group	۹,۲۳	۹,۵۵	۱۰,۹۹	۱۲,۶۰	۱۵,۳۶	۱۷,۷۴
Ave. Number of Common owner	۱	۱	۱	۱	۱	۱

business groups each year. We report summary statistics of ownership features for all pairs in table ۲.

Figure :۱ Three categories for pairs base on being in business groups



Measurement of common-ownership ۳.۲

- جدول ۳ خلاصه ملاک های استفاده شده در ادبیات
- دو دسته ملاک اندازه گیری مالکیت مشترک
- دارای پشتوانه مدل

- * توضیح تئوری دارند
- * تفسیر اقتصادی بهتری دارند
- * جهت دار
- * در سطح صنعت یا شرکت
- * (e.g, Harford et al. (2011); Azar et al. (2018); Gilje et al. (2020))

– مدل های بدون پشتوانه

- * تفسیر اقتصادی مشخصی ندارند
- * شک است که چگونه انگیزه مدیران را اندازه می گیرند
- * ویژگی های نامطلوبی دارند
- * محاسبه ساده است
- * در سطح جفت و بدون جهت می توان محاسبه شود
- * (e.g, Anton and Polk (2014); Azar (2011); Freeman (2019); Hansen and Lott Jr (1996); He and Huang (2017); He et al. (2019); Lewellen and Lowry (2021); Newham et al. (2018))

- هدف اصلی بررسی اثر مالکیت مشترک بر هم حرکتی در سطح جفت است
- برای این هدف نیاز به ملاک در سطح جفت بدون جهت است با تفسیر اقتصادی مناسب
- ملاک Polk and Anton (۲۰۱۴) میزان درصد مالکیت مشترک از مارکت دو شرکت است

- از این ملاک استفاده می کنیم ولی مشکلی دارد
- این ملاک توزیع مالکیت را در نظر نمی گیرد
- برای همین از این ملاک استفاده می کنیم

$$\text{Overlap}_{Sqrt}(i, j) = \left[\frac{\sum_{f=1}^F (\sqrt{S_{i,t}^f P_{i,t}} + \sqrt{S_{j,t}^f P_{j,t}})}{\sqrt{S_{i,t} P_{i,t}} + \sqrt{S_{j,t} P_{j,t}}} \right]^2 \quad (1)$$

- در بخش A دلیل انتخاب این ملاک بیان شده است

Table 3: This table summarizes common ownership measurements in the literature.

Group	Paper	measurment	Flaws
Model Based	Harford et al. (2011)	$\sum_{i \in I^{A,B}} \frac{\alpha_{i,B}}{\alpha_{i,A} + \alpha_{i,B}}$	Bi-directional
	Azar et al. (2018)	$\sum_j \sum_k s_j s_k \frac{\sum_i \mu_{ij} \nu_{ik}}{\sum_i \mu_{ij} \nu_{ij}}$	Industry level
	Gilje et al. (2020)	$\sum_{i=1}^I \alpha_{i,A} g(\beta_{i,A}) \alpha_{i,B}$	Bi-directional
Ad hoc	He and Huang (2017); He et al. (2019)	$\sum_{i \in I^{A,B}} 1$	invariant to the level of common ownership
	Newham et al. (2018)	$\sum_{i \in I^{A,B}} \min\{\alpha_{i,A}, \alpha_{i,B}\}$?
	Anton and Polk (2014)	$\sum_{i \in I^{A,B}} \alpha_{i,A} \frac{\bar{\nu}_A}{\bar{\nu}_A + \bar{\nu}_B} + \alpha_{i,B} \frac{\bar{\nu}_B}{\bar{\nu}_A + \bar{\nu}_B}$	Invariant to the decomposition of ownership
	Freeman (2019); Hansen and Lott Jr (1996)	$\sum_{i \in I^{A,B}} \alpha_{i,A} \times \sum_{i \in I^{A,B}} \alpha_{i,B}$?
			?

- در هر روز مالکیت مشترک با ملاک اصلاح شده تولید شده است
- مقدار میانگین ماهانه آن به عنوان مقدار ماهانه استفاده شده است
- جدول ۴ نتایج محاسبات برای مالکیت مشترک ملاک ساده (FCAP) و اصلاح شده (MFCAP)
- مالکیت مشترک برای گروه های کسب و کار حدودا ۵ برابر و برای صنعت یکسان حدودا ۳ برابر است

جدول ۴ : text

۵

subset	FCAP					MFCAP				
	All	Same Group	Not Same Group	Same Industry	Not Same Industry	All	Same Group	Not Same Group	Same Industry	Not Same Industry
mean	0.144	0.346	0.072	0.207	0.140	0.158	0.474	0.087	0.274	0.150
std	0.166	0.265	0.102	0.215	0.161	0.234	0.478	0.154	0.383	0.217
min	0.002	0.004	0.003	0.003	0.002	0.002	0.005	0.003	0.003	0.002
25%	0.030	0.081	0.020	0.041	0.029	0.031	0.096	0.020	0.044	0.030
50%	0.077	0.321	0.037	0.120	0.074	0.079	0.367	0.038	0.126	0.077
75%	0.193	0.561	0.078	0.314	0.187	0.191	0.691	0.087	0.351	0.183
max	1.000	1.000	0.998	0.999	1.000	12.650	6.174	6.184	6.262	12.650

Stock Return comovement ۴.۲

We calculate the monthly correlation of each pair from stocks' daily abnormal returns. Benchmark for calculating abnormal return is the following equation which is a four-factor model plus industry return due to the importance of industries on stocks' return in the Tehran stock exchange (TSE) :

$$R_{i,t} = \alpha_i + \beta_{mkt,i}R_{M,t} + \beta_{Ind,i}R_{Ind,t} + \beta_{HML,i}HML_t + \beta_{SMB,i}SMB_t + \beta_{UMD,i}UMD_t + \varepsilon_{i,t} \quad (۲)$$

where $R_{i,t}$, $R_{M,t}$ and $R_{Ind,t}$ are excess daily return of respectively firm, market and firm's industry from bank deposit's daily rate(risk free). Other variables definition is base on Carhart four-factor model]Carhart) ۱۹۹۷.[

At the end of each month, we estimate our benchmark model base on the past three-month period (from two months before the end of the preceding month) and measure daily residuals. After that, we calculate the monthly correlation of daily residuals during that month for the pair.

We use other benchmarks for calculating a monthly correlation and report its summary in table ۵. As we expected, models that include industry returns remove pairs' correlation. According to the results, it seems that our selected benchmark ۴) Factor + Industry) almost captures all the pairs' comovement because it is nearly a zero mean variable. We use these correlations for our analysis.

Table 5: This table reports distribution of calculated correlation base on different models.

	mean	std	min	median	max
CAPM + Industry	0.021	0.200	-1.0	0.016	1.0
4 Factor	0.032	0.202	-1.0	0.025	1.0
4 Factor + Industry	0.016	0.199	-1.0	0.010	1.0

Controls ۵.۲

- هم حرکتی ممکن است ویژگی های شرکت ها ناشی شده باشد

- اولین دسته کنترل ها برای جفت هاست
 - SameIndustry : صنعت دو شرکت یکسان باشد
 - SameGroup: دو شرکت در یک گروه کسب و کار قرار بگیرند
 - CrossOwnership: حداکثر درصد مالکیت ضربداری میان دو شرکت
- جدول ۶ نشان داده است 5.7% از جفت های در یک صنعت 6.5% در یک گروه کسب و کار ۱% نیز هم در یک گروه و هم در یک صنعت قرار دارد
- دسته دوم کنترل ها مشخصات شرکت ها را کنترل می کند
 - Size۱: نرمالایزد رنگ ترنسفرد اندازه شرکت بزرگتر
 - Size۲: نرمالایزد رنگ ترنسفرد اندازه شرکت کوچکتر
 - BookToMarket۱: نرمالایزد رنگ ترنسفرد نسبت بوک تو مارکت شرکت بزرگتر
 - BookToMarket۲: نرمالایزد رنگ ترنسفرد نسبت بوک تو مارکت شرکت کوچکتر
 - SameSize: منفی مقدار اختلاف اندازه رتبه صدکی دو شرکت نسبت به اندازه
 - SameBookToMarket: منفی مقدار اختلاف اندازه رتبه صدکی دو شرکت نسبت به بوک تو مارکت
- متغیر ها مانند مقاله (Anton and Polk (2014 تعریف شده است
- کنترل ها به صورت روزانه محاسبه شده اند و پس از آن میانگین ماهانه استفاده شده است
- جدول ۷ خلاصه آماری کنترل ها

Table 6: This table reports the number of pairs in the same industry and business group.

	Yes	No
SameIndustry	4541 (5.7%)	74837 (94.3%)
SameGroup	1834 (6.3%)	27157 (93.7%)
SameGroup & SameIndustry	696 (0.9%)	79378 (99.1%)

Table 7: This table shows the summary statistics of specified controls in empirical studies.

	mean	std	min	median	max
Size1	0.58	0.23	0.01	0.58	1.00
Size2	0.30	0.20	0.00	0.25	0.99
SameSize	-0.29	0.20	-0.97	-0.24	-0.00
BookToMarket1	0.54	0.25	0.00	0.57	1.00
BookToMarket2	0.55	0.24	0.00	0.56	1.00
SameBookToMarket	-0.32	0.20	-0.99	-0.27	-0.00
CrossOwnership	0.14	2.59	0.00	0.00	95.77

Results ۳

Forecasting Co-movement ۱.۳

in the following month. We empirically test the impact of current measured common ownership on the next period's co-movement. At the first step, we study the effects of business groups and common ownership on the co-movement. As it has shown in ۳, a higher level of common ownership in the current period is associated with a higher level of correlation. In the following we examine the following period's co-movement on the considered variables.

$$\begin{aligned}
 \rho_{ij,t+1} = & \beta_0 + \beta_1 * \text{MFCAP}_{ij,t}^* + \beta_2 * \text{SameGroup}_{ij} \\
 & + \beta_3 * \text{MFCAP}_{ij,t}^* \times \text{SameGroup}_{ij} \\
 & + \sum_{k=1}^n \alpha_k * \text{Control}_{ij,t} + \varepsilon_{ij,t+1}
 \end{aligned} \tag{۳}$$

For this purpose, we estimate the cross-sectional regressions forecasting within-month realized correlation $\rho_{i,j,t+1}$ of each pair of stocks abnormal return. By abnormal return, we mean daily four-factor plus industry residuals of estimated model (Specific details and reasons for using this model described in the section ۴.۲.) We use $\text{MFCAP}_{ij,t}^*$, Group Same_{ij} , and their interaction for our main analysis and other pair characteristics as controls:

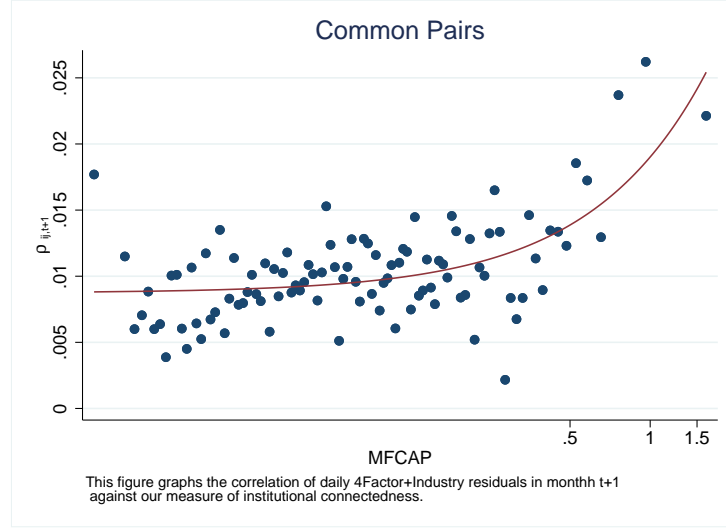


Figure :۲ Future monthly correlation for different level of common ownership at this period

We estimate these regressions for each month and report the time-series average as in [Fama and MacBeth](#))۱۹۷۳(to don't have any problem with cross-correlation in the residuals. We then use [Newey and West](#))۱۹۸۷(to calculate standard errors of the Fama-MacBeth that take into account autocorrelation in the time series of cross-sectional estimates for four lags $4(71/100)^{\frac{2}{5}} = 3.71 \sim 4.$

The estimated results are presented in tables ۸ and ۹. In the two first columns table ۸, we estimate a simplified version of equation ۴ with only common ownership measure ($MFCAP_{i,j}^*$). In the first column, we estimate the model without control variables. Recall that our control variables are Same Industry, Same Size, Same Book to Market, and Cross-Ownership. The Same Size and the Same Book to Market are normalized to have a standard deviation of one and are transformed so that higher values indicate greater style similarity. We find that $MFCAP_{i,j}^*$ is significant with a coefficient of 0.00112 and a t-statistics of 2.11 in the presence of control variables.

In Columns ۳ and ۴ of that table, we use another simplified version of equation ۴, with only Same Group. The estimated coefficient in this specification, Same Group is highly statistically significant, with a coefficient

of 0.0153 and a t-statistics of 7.9. There is a significant difference in the impact of same business groups and the common ownership, according to the results.

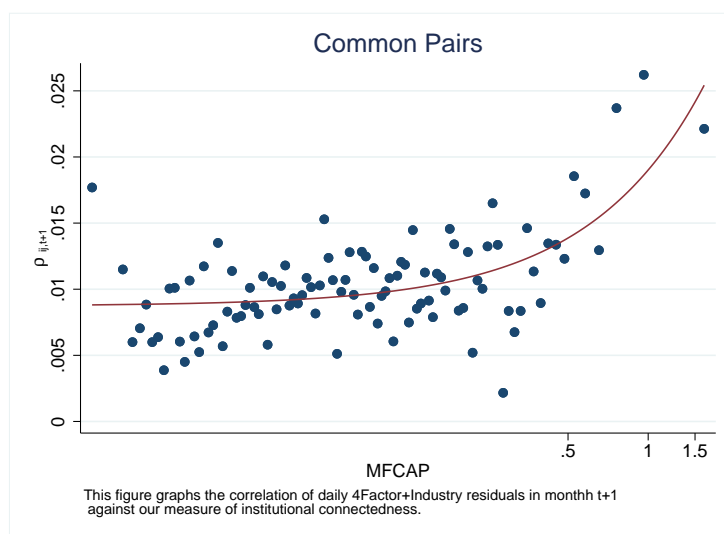
In the fifth specification of table 4, we use both Same Group and $MFCAP_{ij,t}^*$ as a forecasting variable. In this specification, only Same Group has a significant effect on our estimation. It suggests that pair in the same business group affects more than a higher level of common ownership Anton and Polk (2014) study large firms but we do not restrict our investigation. In the last column of table 4, we control for pairs type (Pairs is large or small if both firms are large or small. If one firm is large and other is small, we call it hybrid.) Estimation results in table 4 shows that for all the pairs Same Group significantly increases co-movement.

In Table 4, we examine effect of common ownership in the business groups. In two first columns, we restrict our investigation to two subsamples. In the first one, we run our model for the pairs in the same business group and others who do not belong to the same one in the second one. It provides evidence that common ownership only matters for the pairs in the same business groups.

Now for the main analysis, we include the interaction of Same Group and $MFCAP_{ij,t}^*$. We include the business group fixed effects to capture the group's characteristics for the last column. These results aver that $MFCAP_{ij,t}^*$ has a larger effect for the pairs in the same business group. It puts forward that the Same Group affects co-movement through indirect common ownership, which arises due to the same ultimate owner.

- در مرحله اول بررسی رابطه مالکیت مشترک و گروه های کسب و کار با هم حرکتی شرکت ها بررسی کرده ایم
- در شکل 3 رابطه هم حرکتی دوره آینده با مالکیت مشترک در این دوره قابل مشاهده است
- هم حرکتی دوره آینده را بر روی متغیرهای مورد نظر برآورد می کنیم:

$$\begin{aligned} \rho_{ij,t+1} = & \beta_0 + \beta_1 * MFCAP_{ij,t}^* + \beta_2 * SameGroup_{ij} \\ & + \beta_3 * MFCAP_{ij,t}^* \times SameGroup_{ij} \\ & + \sum_{k=1}^n \alpha_k * Control_{ij,t} + \varepsilon_{ij,t+1} \end{aligned} \quad (4)$$



شکل ۳: Future monthly correlation for different level of common ownership at this period

- برای هر ماه این معادله برآورد می شود و متوسط سری زمانی ضرایب به شیوه [Fama and MacBeth \(1973\)](#) برآورد شده است
- این شیوه انتخاب شده است تا مشکلی با cross-correlation نداشته باشیم
- انحراف معیار هم به شیوه [Newey and West \(1987\)](#) اصلاح شده است تا autocorrelation را بر طرف کنید
- تا ۴ دوره قبل را بر طرف می کنید $(4(71/100))^{\frac{2}{9}} = 3.71 \sim 4$
- نتایج برآورد در جدول ۸ و ۹ نشان داده شده است

– جدول ۸

- * در دو ستون اول اثر مالکیت مشترک بر روی هم حرکتی بررسی کرده ایم
- * در ستون ۳ و ۴ فقط گروه های کسب و کار را برآورد کرده ایم حدوداً 1.5 درصد هم حرکتی افزایش پیدا می کند
- * اثر گروه کسب و کار بیشتر از مالکیت مشترک است
- * با اضافه کردن گروه کسب و کار و مالکیت مشترک، مالکیت مشترک اثر خود را از دست می دهد

– جدول ۹

- * مالکیت مشترک فقط در گروه های کسب و کار اثر دارد
- * در دو ستون آخر هم بدون محدود کردن جامعه بودن در گروه را بررسی کرده ایم و یافتیم که در گروه کسب و کار مالکیت مشترک اهمیت دارد
- * ستون آخر اثر ثابت گروه های کسب و کار را اضافه کردیم نتایج برقرار است

جدول ۸ : Co-movement Connected

	Dependent Variable: Future Pairs's co-movement					
	(1)	(2)	(3)	(4)	(5)	(6)
MFCAP*	0.00150** (2.90)	0.00112* (2.11)			0.000736 (1.33)	0.000308 (0.60)
Same Group			0.0166*** (8.54)	0.0153*** (7.90)	0.0147*** (6.97)	0.0164*** (8.68)
Observations	1665996	1665996	1665996	1665996	1665996	1665996
Sub-sample	All	All	All	All	All	All
Group Effect	No	No	No	No	No	No
Controls	No	Yes	No	Yes	Yes	Yes
PairType Control	No	No	No	No	No	Yes
R^2	0.000170	0.000652	0.000180	0.000637	0.000804	0.00120

t statistics in parentheses

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

جدول ۹ : Co-movement Connected

	Dependent Variable: Future Pairs's co-movement				
	(1)	(2)	(3)	(4)	(5)
MFCAP*	0.00936*** (6.75)	-0.0000113 (-0.02)	-0.0000771 (-0.14)	-0.000175 (-0.34)	-0.000175 (-0.34)
Same Group			0.00750*** (3.53)	0.00684** (2.96)	0.00684** (2.96)
(MFCAP*) \times SameGroup			0.0105*** (6.72)	0.0109*** (7.02)	0.0109*** (7.02)
Observations	58337	1607659	1665996	1665996	1665996
Sub-sample	SameGroup	Others	All	All	All
Group Effect	No	No	No	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
PairType Control	Yes	Yes	Yes	Yes	Yes
R^2	0.0174	0.000942	0.00130	0.00605	0.00605

t statistics in parentheses

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

High level of common ownership ۲.۳

In line with the previous estimations, figure ۴ provides that a higher level of common ownership affects more on the firms' co-movement. As shown in table ۴, pairs in the same business group have a higher level of common ownership than others. So, the previous results could be drive from high level of common ownership For detailed analysis, we restrict our sample to the higher level of common ownership, which we define as the pairs with $FCA_{ij,t}$ in the fourth quarter in each period. Figure ۵ shows the relation between future co-movement and current measurement of common ownership for that pairs. As you can see in the left panel, in line with the last explanation, common ownership only affects the pairs in the same group, and common ownership without the same group will not affect pairs' co-movement although for a high level of common ownership.

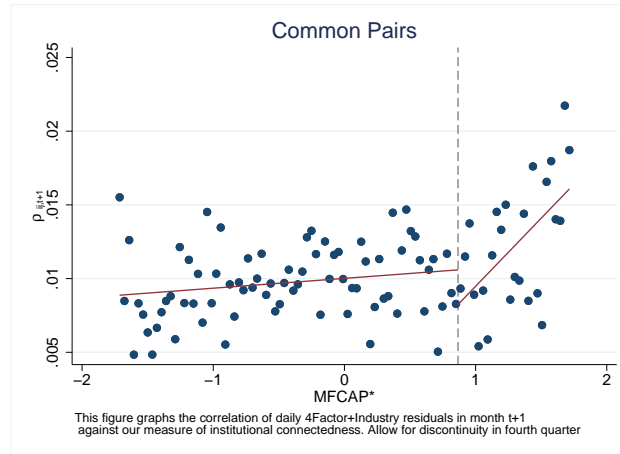


Figure :۴ text

We estimate the equation ۴ with the same methodology in section ۱.۳ for the sub-sample of a high level of common ownership. Table ۱۰ reports estimations results. As expected, firms in the same business group have a high statistical and economically significant effect on forecasting future co-movements. Columns six and seven prove our prior explanations for the importance of business groups compared to common ownership in pairs with a higher level of common ownership.

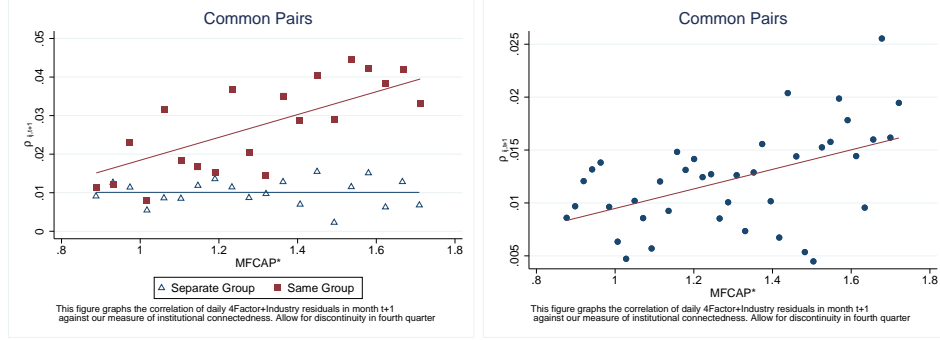


Figure :8 text

Table 10: Estimation results for high level of common ownership

	Dependent Variable: Future Pairs's co-movement						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Same Group	0.0287*** (9.98)		0.0293*** (10.54)	0.0270*** (9.96)	0.0261*** (9.66)	-0.0280** (-2.81)	-0.0252* (-2.38)
MFCAP*		0.00949** (2.81)	-0.000569 (-0.17)	-0.00119 (-0.35)	-0.00100 (-0.29)	-0.00407 (-1.15)	-0.00353 (-1.02)
(MFCAP*) \times SameGroup						0.0363*** (5.03)	0.0340*** (4.33)
SameIndustry				0.00643** (3.34)	0.00540** (2.76)	0.00492* (2.48)	0.00547* (2.50)
SameSize					0.00676* (2.39)	0.00588* (2.11)	0.00465 (1.57)
SameBookToMarket					0.00917*** (3.88)	0.00909*** (3.87)	0.00925*** (3.93)
CrossOwnership					0.0321* (2.16)	0.0378* (2.45)	0.0417** (2.65)
Observations	417377	417377	417377	417377	417377	417377	417377
Group FE	No	No	No	No	No	No	Yes
PairType Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.00212	0.000961	0.00236	0.00279	0.00358	0.00388	0.0146

t statistics in parentheses

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

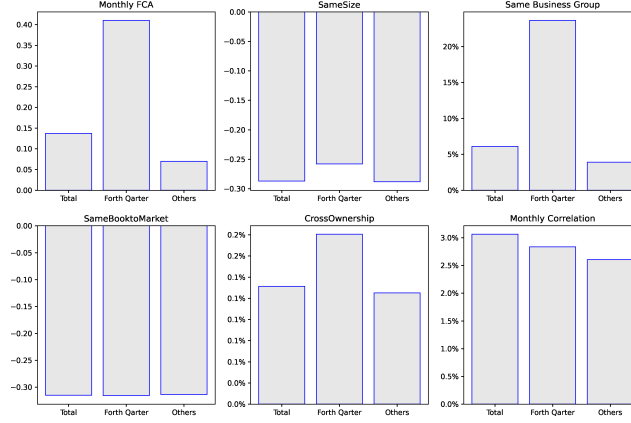


Figure :9 Pairs' characteristics for the pairs with high level of common ownership

Pairs All ۳.۳

In the former analyses, we restrict our investigation to firms with at least one common owner. By this analysis, we cannot separate the effect of the business group and common ownership: both of them can affect comovement. Furthermore, this restriction limits our result to commonly held firms, but if belonging to the same business group can increase stocks' comovement, it would affect all the firms in the same business group. So, we extend our investigation by constructing all the pairs in the market to separate the effect of direct common ownership and business group and solve the mentioned problem.

For this purpose, we include stocks in one pair if they have at least two months in common. By this definition, we do not restrict our investigation to commonly held stocks and set $MFC A_{ij,t}$ to zero for a pair without any common owner. Controls are defined as before, and we use the same methodology as used for estimating equation ۴. We estimate equation ۴.

Table ۱۱ reports results of estimations for two models. These results suggest that pairs in the same group co-move more than stocks that are not in the same group. In addition, pairs with common ownership common does not co-move greater than others. In columns ۳, we use variables of common ownership and the same business group together. Re-

sults supported our previous explanation of table ?? that the Same Group is critical for forecasting future co-movement, and common ownership does not matter for pairs. In the pairs with common ownership, pairs in the same group have a higher level of co-movement than the pairs no in the same group.

Table 11: Non-connected Co-movement

	Dependent Variable: Future Pairs' co-movement						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SameGroup	0.0156*** (9.84)		0.0158*** (10.22)			0.0138*** (8.27)	0.0131*** (7.68)
MFCAP*		-0.0000723 (-0.44)	-0.000277 (-1.80)	0.00169 (1.42)	-0.000322* (-2.19)	-0.000390** (-2.70)	-0.000427* (-2.29)
(MFCAP*) \times SameGroup						0.00313** (2.80)	0.00364** (3.34)
Observations	6018646	6018646	6018646	114526	5904120	6018646	6018646
Sub Sample	Total	Total	Total	SameGroups	Others	Total	Total
Group Effect	No	No	No	No	No	No	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.000765	0.000700	0.000803	0.0121	0.000629	0.000829	0.00354

t statistics in parentheses

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

more is group business same that show results these , conclusion In pres- the about talk we when fact, In ownership. common than important of level high a about talk we group, business same the in stocks two of ence measure cannot we that stocks two between ownership common invisible stockholders. mutual by that

Evidence for correlated trading ¶

In the previous sections, we have provided evidence consistent with the hypothesis that the presence of firms in the business groups can raise firms' co-movement. Although we don't have definitive insight into the specific channel that business groups can promote commonality, our analysis provides a useful overview. We claim that this relationship exists because the business group is an important proxy for the likelihood that

trading in these stocks will be correlated. To gain a clearer understanding of how the business group is able to generate co-movement in firms' return, we now refine our basic analysis to consider other proxy measures for business group trading. We employ two proxies for business group trading that are designed to capture different trading motivations: turnover and institutional imbalance. While the first could be due to buying or selling of business groups, the latter reflects buying.

Turnover 1.4

First of all, we should show that stocks in groups have a similar daily trading behavior. Accordingly, We use the turnover measure as a daily trading measures. For each firm we run time-series regressions of the firm's daily change in turnover, $\Delta \text{TurnOver}_{i,t}$, on changes in market turnover, $\Delta \text{TurnOver}_{\text{Market},t}$, changes in the industry and business group portfolio's turnover, $\Delta \text{TurnOver}_{\text{Ind},t}$ and $\Delta \text{TurnOver}_{\text{Group},t}$ and, as well as control variables. We compute the daily change of turnover by this definition $\Delta \text{TurnOver}_{i,t} = \ln(\frac{\text{TurnOver}_{i,t}}{\text{TurnOver}_{i,t-1}})$. We estimate the following regression for each stock across trading days in given year separately and cross-sectional averages of the estimated coefficients are reported, with t-statistics in parentheses :

$$\Delta \text{TurnOver}_{i,t} = \alpha + \beta_{\text{Market},t} \Delta \text{TurnOver}_{\text{Market},t} + \beta_{\text{Ind},t} \Delta \text{TurnOver}_{\text{Ind},t} + \beta_{\text{Group},t} \Delta \text{TurnOver}_{\text{Group},t} + \delta \text{Controls} + \varepsilon_{i,t}$$

We control for lead and lag changes in the two portfolio and market's measures and size of the firm. We estimate that model with [Fama and MacBeth](#) (1993) method and adjust its standard errors with [Newey and West](#) (1994) for seven periods. As shown in Table 12, firms' change in turnover comes from market reaction and group's change. (This result is robust to the different method of weighting for portfolios) This observation shows that firms in one group trade together in each day.

Furthermore, we have to show that firms with higher level of group turnover, have a higher level of co-movement. So, For each month, we extract annual average level of firms' turnover and monthly turnover. We

Table 12: cross-sectional average of the time-series coefficients for daily changes in turnover

	Dependent Variable: $\Delta \text{TurnOver}_i$					
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \text{TurnOver}_{\text{Market}}$	0.405*** (12.25)	0.396*** (10.74)	0.360*** (7.62)	0.425*** (12.08)	0.388*** (8.23)	0.448*** (12.20)
$\Delta \text{TurnOver}_{\text{Group}}$			0.222*** (3.46)	0.229*** (4.09)	0.253** (3.28)	0.268*** (3.82)
$\Delta \text{TurnOver}_{\text{Industry}}$	0.120** (3.25)	0.0205 (0.24)	-0.0156 (-0.23)	-0.0237 (-0.42)	-0.0833 (-1.04)	-0.0999 (-1.46)
Observations	293264	292179	184699	183442	184699	183442
Weight	-	-	MC \times CR	MC \times CR	MC	MC
Control	No	Yes	No	Yes	No	Yes
R^2	0.129	0.168	0.246	0.286	0.247	0.286

t statistics in parentheses

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

assume that the residual of the model belongs to the business groups. We expect that firms in the groups have a lower dispersion in their residuals than firms out of the groups. We calculate firms' residuals. Its summary stats is in table 13. As we expected, residuals in business groups have a lower dispersion than others. We calculate standard error of monthly turnover residuals of firms in the business groups for each business group. Groups' standard errors description is shown in table 14. On average group's standard error is lower than ungrouped ones. For finding relation between standard error of monthly turnover residuals, we define a dummy variable for groups in the low level of standard error which is lower than median. As shown in table 15, pairs in the business groups of low dispersion have a higher level of co-movement than other firms.

Table 13: Frims' Monthly residuals' summary statistics

	Firm \times Month	mean	std	min	25%	50%	75%	max
Grouped								
Ungrouped	8050	-0.001	0.822	-4.789	-0.509	-0.016	0.504	4.407
Grouped	18199	0.001	0.777	-4.832	-0.481	-0.033	0.469	4.955

Table 14: Frims' Monthly residuals' standard erros' summary statistics

	Group \times Month	mean	std	min	25%	50%	75%	max
Grouped								
Ungrouped	72	0.776	0.108	0.516	0.694	0.774	0.840	1.140
Grouped	2393	0.604	0.300	0.001	0.413	0.580	0.763	2.797

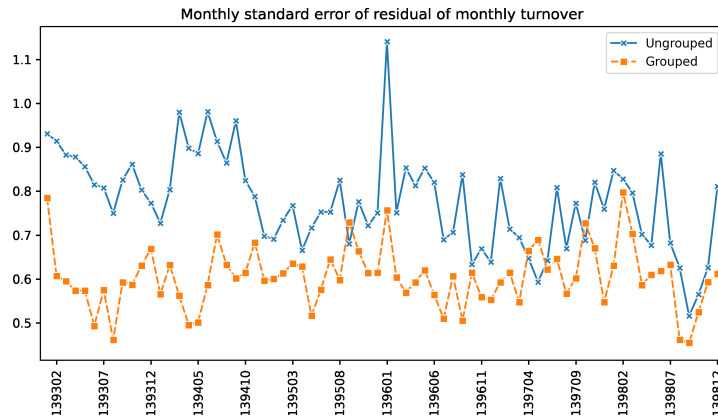


Table 15: text

	Dependent Variable: Future Pairs's co-movement				
	(1)	(2)	(3)	(4)	(5)
Same Group	0.0180*** (8.45)	0.0189*** (8.09)	0.0151*** (5.24)	0.0131*** (5.00)	0.0351*** (5.80)
LowResidualStd		0.00193 (1.99)	0.00159 (1.59)	-0.000678 (-0.84)	
LowResidualStd \times SameGroup			0.00981* (2.57)	0.0119** (3.37)	
Group Turnover std ₁					-0.00119 (-0.64)
Group Turnover std ₂					-0.00292* (-2.28)
Group Turnover std \times SameGroup					-0.0261** (-3.02)
Observations	1665996	1665996	1665996	1665996	1665996
Group Size Effect	No	Yes	Yes	No	Yes
Group Effect	No	No	No	Yes	No
Pair Size FE	Yes	Yes	Yes	Yes	Yes
Sub-sample	Total	Total	Total	Total	Total
Controls	Yes	Yes	Yes	Yes	Yes
R^2	0.00120	0.00150	0.00161	0.00597	0.00173

t statistics in parentheses

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

Institutional Imbalance ۲.۴

Furthermore, we should show that stocks in groups that trade together are traded in the same direction. So, for each firm, we calculate daily institutional imbalances, which is the net buying value of institutional investors relative to total traded value on that day
$$\text{InsImb} = \frac{\text{Buy}_{\text{value}} - \text{Sell}_{\text{value}}}{\text{Buy}_{\text{value}} + \text{Sell}_{\text{value}}}.$$
 (Seasholes and Wu) ۲۰۰۷(We expect that institutional imbalances have a lower variation in groups due to the correlated tradings that the ultimate owner ordered to do. So, at first step, we calculate monthly institutional imbalances for firms. As we expected, firms in the business groups have a lower level of standard error in imbalances (Table ۱۶). In the second step, we calculate the monthly standard deviation of the group's imbalances and compare them to unaffiliated ones. As we expected grouped standard error is 12.9% and significantly (with pvalue of ۰) lower than ungrouped firms.

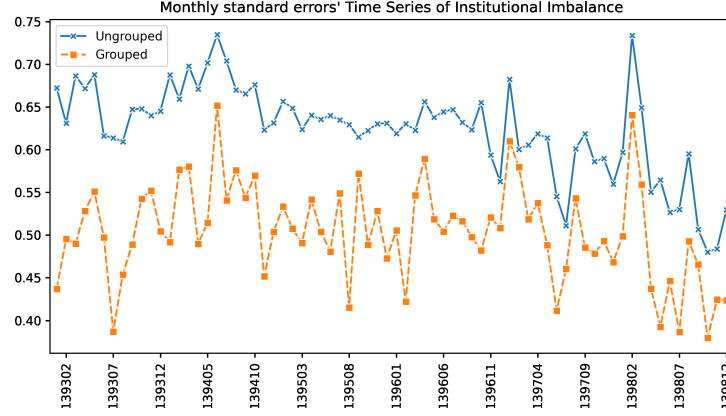
Table 16: text

	Firm \times Month	mean	std	min	25%	50%	75%	max
Grouped								
Ungrouped	20197	0.010	0.630	-1.0	-0.474	0.016	0.479	1.0
Grouped	12021	-0.041	0.581	-1.0	-0.462	-0.009	0.341	1.0

Table 17: text

	Group \times Month	mean	std	min	25%	50%	75%	max
Grouped								
Ungrouped	72	0.624	0.054	0.48	0.601	0.631	0.655	0.735
Grouped	2057	0.502	0.251	0.00	0.337	0.503	0.647	1.414

According to the main hypothesis, we need to compare pairs in groups with low standard error and other pairs. For this purpose, we define Low Imbalance std dummy for groups whose average standard errors are lower than half of the sample. So, this dummy is equal to one if at least one pair's firms belong to the low imbalance std business group. We use the



previous methodology for estimating that model this model:

$$\begin{aligned}
 \rho_{ij,t+1} = & \beta_0 + \beta_1 * \text{SameGroup}_{ij} + \beta_2 * \text{std Imbalance Low} \\
 & + \beta_3 * \text{std Imbalance Low} \times \text{SameGroup}_{ij} \\
 & + \sum_{k=1}^n \alpha_k * \text{Control}_{ij,t} + \varepsilon_{ij,t+1}
 \end{aligned} \tag{5}$$

We expected pairs in the same business groups with a low standard error of buy-sell imbalance co-move more than other pairs. Table 1A reports estimation results. In columns three and four, we use our defined dummy variable and the same group. These results show that pairs in the same group of low imbalance std will comove more than other pairs. Moreover, in the subsample of same business groups, pairs in the low imbalance std comove greater than others. For detailed analysis, we use the interaction of three variables of interest. For using this triple interaction, we use all the interactions between variables. Columns seven and eight report our results. By increasing common ownership in the same groups, pairs in the same business group of low imbalance std will comove greater than others.

Table 18: text

	Dependent Variable: Future Pairs's co-movement				
	(1)	(2)	(3)	(4)	(5)
Same Group	0.0180*** (8.45)	0.0186*** (8.25)	0.00982*** (4.63)	0.00931*** (4.60)	0.135*** (13.96)
Low Imbalance std		0.000899 (0.98)	0.0000151 (0.02)	0.000421 (0.45)	
Low Imbalance std \times SameGroup			0.0235*** (9.05)	0.0228*** (8.46)	
Group Ins Imb std ₁					0.00168 (0.25)
Group Ins Imb std ₂					0.00986 (1.65)
Group Ins Imb std \times SameGroup					-0.198*** (-12.76)
Observations	1665996	1665996	1665996	1665996	599765
Group Size Effect	No	Yes	Yes	No	Yes
Group Effect	No	No	No	Yes	No
Pair Size FE	Yes	Yes	Yes	Yes	Yes
Sub-sample	Total	Total	Total	Total	Total
Controls	Yes	Yes	Yes	Yes	Yes
R^2	0.00120	0.00151	0.00163	0.00601	0.00357

t statistics in parentheses

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

Conclusion ۵

- نحوه محاسبه مالکیت مشترک را بهبود دادیم
- مالکیت مشترک دارای اهمیت است
- گروه های کسب و کار دارای اهمیت است
- گروه کسب و کار از مالکیت مشترک اهمیت بالاتری دارد
- گروه های کسب و کار از طریق معامله هم زمان بر روی هم حرکتی تاثیر می گذارند.

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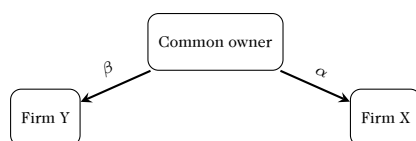
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– دو شرکت x و y با یک مالک مشترک با مالکیت α و β از مارکت کپ دو شرکت با ارزش یکسان. شکل ۷

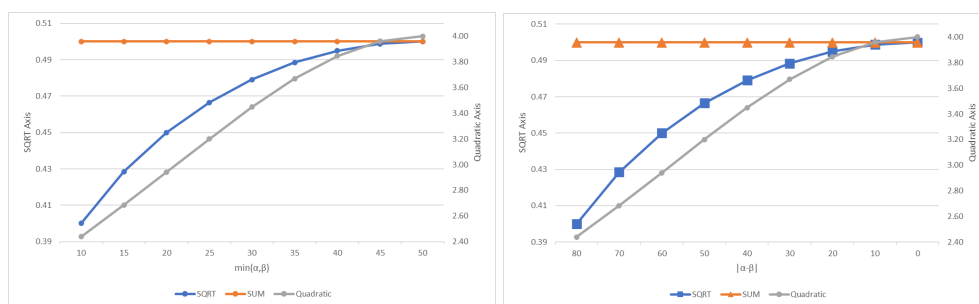
* برای سادگی فرق می کنیم ($\alpha + \beta = 100$)
* شکل مثال

شکل ۷: Numeric example 1



* شکل ۸: نتایج محاسبات را نشان می دهد

شکل ۸: Comparison of three measure for common ownership



*

* ملاک اصلی برای هر توزیعی ثابت است ولی دو ملاک معرفی شده تفاوت را ایجاد کرده است

* مالکیت مشترک در حال ۵۰-۵۰ بیشترین و در حال ۱۰-۹۰ کمترین حالت ممکن است

– حال در مثال قبل فرض کنید سه مالک مشترک داریم که در برای مالک ۱ مالکیت در شرکت x و y عبارت است از α_1 و β_1

* شکل مثال

* نتایج در ۱۹ نشان داده شده است

* برای مالکیت های برابر تمام مارکت کپ تو شرکت نتایج با قبل یکسان است

شکل ۹: Numeric example ۲

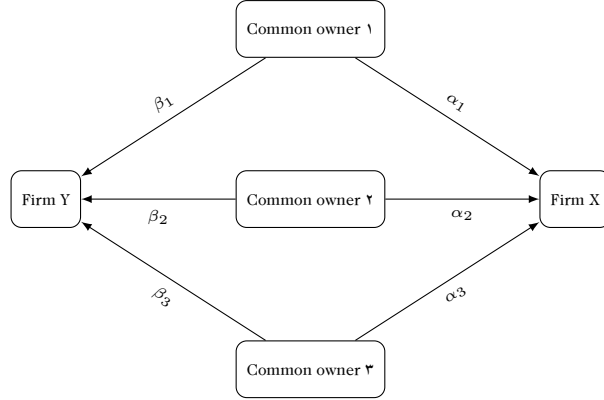


Table 19: text

Ownership	Type I	Type II	Type III	Type IV	Type V	Type VI	Type VII
α_1	1/3	20	10	20	10	5	1
β_1	1/3	10	10	20	10	5	1
α_2	1/3	10	80	20	10	5	1
β_2	1/3	20	80	20	10	5	1
α_3	1/3	70	10	20	10	5	1
β_3	1/3	70	10	20	10	5	1
SQRT	3	2.56	2.33	1.8	0.9	0.45	0.09
SUM	1	1	1	0.6	0.3	0.15	0.03
Quadratic	3	1.85	1.52	8.33	33.33	133.33	3333.33

* ستون اول هم تفسیر ملاک را نشان می دهد که در صورت تقسیم شرکت به ۳ مالک، عدد برابر ۳ است

* برای مالکیت های کمتر از ۱۰۰ درصد ملاک درجه ۲ مقادیر غیر واقعی تولید می کند

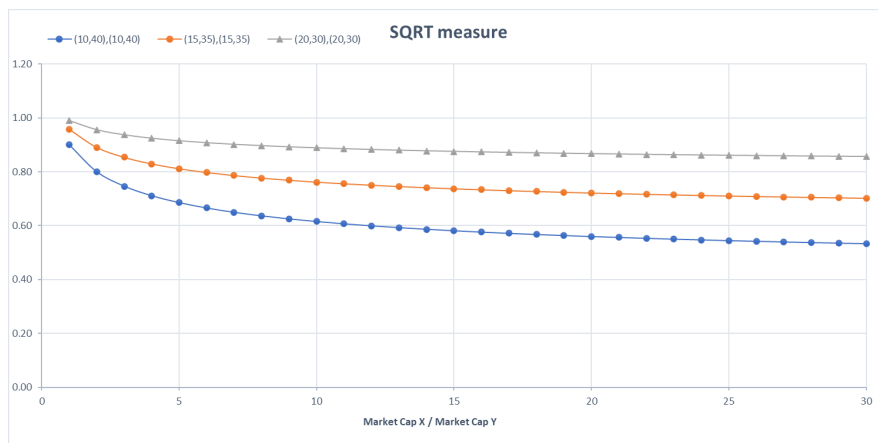
* برای همین از ملاک جذری استفاده می کنیم

– حال فرض اصلی که ارزش بازاری دو شرکت برابر است را کنار می گذاریم برای مثال دو شرکت را با دو مالک مشترک در حالت های مختلف بررسی می کنیم

* شکل ۱۰ و ۱۱ نتایج را برای جمع ثابت مالکیت برای سه حالت توزیع مختلف رسم شده است

*

Figure 10: SQRT measure for fixed aggregate ownership on different relative market cap ratios



* جدول ۲۰ نتایج محاسبات را نشان داده است.

*

* ملاک وزن دهی جذری به دلیل تغییرات بهتر و مقادیر معقول برای مقادیر کم مالکیت مشترک انتخاب شده است

۱.آ Common Ownership measure

- برآورد مدل اصلی برای دو نوع اندازه گیری مالکیت مشترک
- به شیوه قبلی

Figure 11: Sum measure for fixed aggregate ownership on different relative market cap ratios

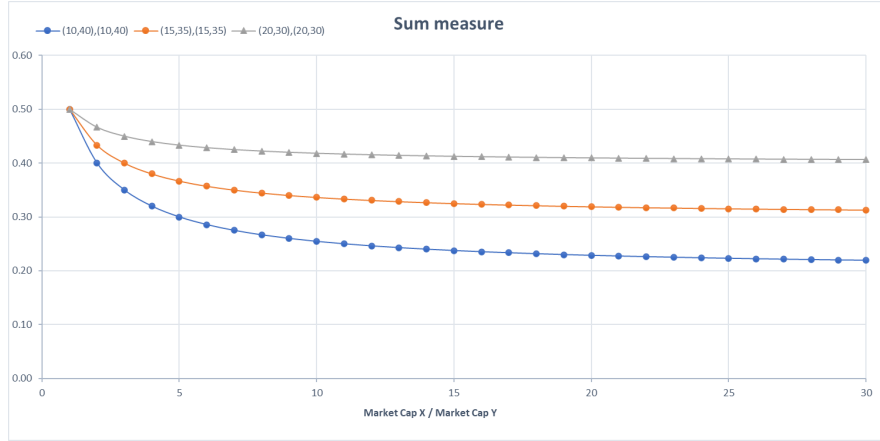


Table 20: text

$\frac{\text{MarketCap}_x}{\text{MarketCap}_y}$	$(\alpha_1, \beta_1), (\alpha_2, \beta_2)$					
	$(10,40), (10,40)$		$(15,35), (15,35)$		$(20,30), (20,30)$	
	SQRT	SUM	SQRT	SUM	SQRT	SUM
1	0.90	0.50	0.96	0.50	0.99	0.50
2	0.80	0.40	0.89	0.43	0.96	0.47
3	0.75	0.35	0.85	0.40	0.94	0.45
4	0.71	0.32	0.83	0.38	0.92	0.44
5	0.69	0.30	0.81	0.37	0.91	0.43
6	0.67	0.29	0.80	0.36	0.91	0.43
7	0.65	0.28	0.79	0.35	0.90	0.43
8	0.64	0.27	0.78	0.34	0.90	0.42
9	0.63	0.26	0.77	0.34	0.89	0.42
10	0.62	0.25	0.76	0.34	0.89	0.42

- در نظر گرفتن توزیع سبب کاهش معناداری می شود که نشان می دهد بین حالت های مختلف توزیع تفاوت وجود دارد
- اثر در اندازه گیری جمع ساده بیش از اندازه برآور می شد

جدول ۲۱: Co-movement Connected

	Dependent Variable: Future Monthly Correlation of 4F+Industry Residuals									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Common Ownership Measure	0.00177*** (3.93)	0.00150** (2.90)	0.00133** (2.76)	0.00102 (1.87)	0.000936 (1.90)	0.000663 (1.17)	0.000536 (1.06)	0.000377 (0.65)	-0.0000197 (-0.04)	-0.0000113 (-0.02)
Same Group			0.0156*** (7.32)	0.0157*** (7.44)	0.00774*** (3.61)	0.00813*** (3.71)	0.00575* (2.62)	0.00624** (2.81)	0.00503* (2.11)	0.00549* (2.27)
Common Ownership Measure × SameGroup					0.0103*** (7.76)	0.00935*** (6.72)	0.0110*** (7.47)	0.00992*** (6.49)	0.0119*** (7.94)	0.0107*** (6.97)
SameIndustry							-0.000364 (-0.21)	-0.000312 (-0.19)	0.000286 (0.17)	0.000339 (0.21)
SameSize							0.0133*** (4.48)	0.0135*** (4.56)	0.0131*** (4.61)	0.0132*** (4.68)
SameBookToMarket							0.00772*** (4.55)	0.00772*** (4.58)	0.00893*** (5.05)	0.00893*** (5.09)
CrossOwnership							0.0280* (2.07)	0.0260 (1.93)	0.0303* (2.27)	0.0283* (2.14)
Observations	1665996	1665996	1665996	1665996	1665996	1665996	1665996	1665996	1665996	1665996
Group FE	No	No	No	No	No	No	No	No	Yes	Yes
Measurement	Sum	Quadratic	Sum	Quadratic	Sum	Quadratic	Sum	Quadratic	Sum	Quadratic
R ²	0.000171	0.000170	0.000348	0.000349	0.000443	0.000437	0.000898	0.000898	0.00575	0.00575

t statistics in parentheses

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

پيوست ب Overview of Business Groups in Tehran Stock Exchange

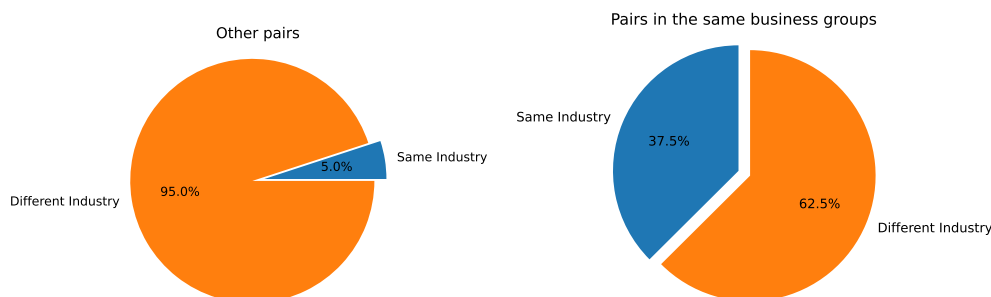
- گروه های کسب و کار در کشور های در حال توسعه و توسعه یافته وجود دارد
[Khanna and Yafeh \(2007\)](#)
- گروه کسب و کار مجموعه ای از شرکت های به هم پیوسته است که از لحاظ قانونی غیروابسته هستند ولی ارتباطات رسمی از طریق برای مثال سرمایه و غیر رسمی مانند فامیلی دارند
- در چین و ایران گروه های کسب و کار مرتبط با حاکمیت هستند
- لایه های پیچیده و تو در تو مالکیت در ایران وجود دارد
[Farajpour et al. \(2019\)](#)

- دلیل اصلی بسیاری از گروه های کسب و کار در ایران انقلاب سال ۱۳۷۵ می باشد

(Aliabadi et al. (2021)

- بسیاری از شرکت های قبل از انقلاب دولتی شدند
- بخشی از شرکت های حاضر در صنایع نیز توسط IDRO ایجاد شده است
- در ادامه فاز های متوالی خصوصی سازی توسط دولت در بازار سرمایه بوده است
 - * در فاز اول خصوصی سازی حدود ۳۰۰ شرکت خصوصی شده اند
 - * در فاز دوم حدودا ۱۵۰ میلیارد دلار از شرکت های دولتی خصوصی شدند
 - * صندوق های بازنشستگی، موسسات نظامی، موسسات فرهنگی و دینی و موسسات انقلابی مشتری های اصلی مرحله دوم خصوصی سازی بوده اند
 - * در این فاز بسیاری از گروه های کسب و کار تشکیل شده اند و شرکت ها از دولتی به شبه دولتی تبدیل شده اند
- فاز های خصوصی سازی و گسترش بازار سرمایه ایران سبب تغییر ساختار مالکیت در شرکت های قبل از انقلاب و موسسات بعد از انقلاب شده است
- سبب ایجاد گروه های کسب و کار بزرگ شده است که بسیاری از صنایع و شرکت ها را مدیریت می کنند
- انتظار داریم شرکت ها حاضر در گروه های کسب و کار در یک صنعت حضور داشته باشند
 - ۳۸% جفت های شناسایی شده در یک گروه کسب و کار در یک صنعت قرار دارند
 - تنها ۵% جفت های شناسایی شده بیرون یک گروه کسب و کار در یک صنعت قرار دارند

شکل ۱۲



- از نظر اندازه و نسبت بوک تو مارکت جفت های گروه های کسب و کار شبیه جامعه هستند
- همانطور که قبلا هم گفتیم متوسط مالکیت مشترک در گروه های کسب و کار زیاد است
- شکل ۱۳ خلاصه ها را نشان داده است

شکل ۱۳

