Connected Stocks: Evidence from Tehran Stock Exchange

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Effects

Hypothesis 1

Simple measures of institutional connnectedness statistically and economically improve forecasts of cross-sectional variation in the correlation. The effect is stronger for pairs that are in the same business groups.

	Dependent Variable: Future Monthly Correlation of 4F+Industry Residuals						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Same Group	0.0138***	0.0128***			0.00978***	0.00458	0.00356
	(5.76)	(6.29)			(4.29)	(1.43)	(1.11)
FCA*			0.00405***	0.00375***	0.00296***	0.00258***	0.00273***
			(4.94)	(5.12)	(3.77)	(3.53)	(3.51)
(FCA*) × SameGroup						0.00524**	0.00517**
						(3.21)	(3.18)
Observations	388492	388492	388492	388492	388492	388492	388492
Group Effect	No	No	No	No	No	No	Yes
Controls	No	Yes	No	Yes	Yes	Yes	Yes
R^2	0.000404	0.00200	0.000423	0.00201	0.00229	0.00245	0.00875

t statistics in parentheses

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

Hypothesis 2

Pairs of companies belonging to the same business group have a higher correlation than pairs not in the same group. In addition, Pairs that belong to the same group and have a common ownership co-move more than pairs that don't have common ownership.

Table 1: one of these tables

	Future Monthly Correlation of 4F+Industry Residuals					
	(1)	(2)	(3)	(4)	(5)	(6)
(FCA > $Median$[FCA])		-0.00168	-0.00337**	0.00855**		-0.00513***
		(-1.45)	(-2.89)	(2.76)		(-4.32)
SameGroup	0.0122***		0.0135***			0.00574*
	(5.81)		(6.48)			(2.02)
(FCA > $Median$[FCA]) × SameGroup						0.0181***
						(5.91)
FCA*					0.00174*	
					(2.43)	
Observations	5148109	5148109	5148109	76240	76240	5148109
Sub Sample	Total	Total	Total	SameGroups	SameGroups	Total
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.000455	0.000439	0.000485	0.0136	0.0135	0.000513

t statistics in parentheses

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

	Future Monthly Correlation of 4F+Industry Residuals					
	(1)	(2)	(3)	(4)	(5)	(6)
(FCA > $Q3$[FCA])		0.00543***	0.00549***	0.00695*		0.00539***
		(4.12)	(4.17)	(2.10)		(4.04)
SameGroup	0.0122***		0.0124***			0.00901*
	(5.81)		(5.97)			(2.62)
(FCA > $Q3$[FCA]) × SameGroup						0.00392
						(1.20)
FCA*					0.00174*	
					(2.43)	
Observations	5148109	5148109	5148109	76240	76240	5148109
Sub Sample	Total	Total	Total	SameGroups	SameGroups	Total
Controls	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.000455	0.000457	0.000501	0.0133	0.0135	0.000512

t statistics in parentheses

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

Hypothesis 3

Stock returns of group affiliated firms exhibit robustly positive comovement even after controlling for both market and industry effects. Group betas ($\beta_{Businussgroup}$) are highly significant across all models.

Table 2: Cross-sectional average of the time-series coefficients

	$\text{Return}_i - r_f = R_i$				
	(1)	(2)	(3)	(4)	(5)
R_M	0.801***	0.643***	0.701***	0.257***	0.280***
	(29.99)	(10.68)	(11.05)	(8.84)	(9.02)
$R_{Industry}$		-2.085	-1.878	-0.150	-0.148
		(-0.92)	(-0.93)	(-0.48)	(-0.50)
$R_{Businessgroup}$				0.493***	0.493***
				(11.36)	(11.34)
SMB			0.104***		0.0770***
			(3.52)		(5.24)
UMD			0.0282		0.0218
			(1.23)		(1.94)
HML			0.102***		0.0395***
			(6.05)		(6.39)
Constant	0.0442	0.0145	-0.0297	0.0499***	0.0198
	(1.92)	(0.53)	(-0.83)	(3.87)	(1.25)
Observations	207552	207552	207552	207552	207552
R^2	0.123	0.196	0.213	0.672	0.679

t statistics in parentheses

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

Channels

Trading

Furthermore, we should show that stocks in groups have a similar daily trading behavior. Accordingly, for each firm we run time-series regressions of the firm's daily change in trading measure, $\Delta\text{Measure}_{i,t}$, on changes in market measure,$\Delta\text{Measure}_{Market,t}$, changes in the industry and business group portfolio's measure,$\Delta\text{Measure}_{Ind,t}$ and $\Delta\text{Measure}_{Group,t}$ and ,as well as control variables.

We compute the daily change of measure by this definition $\Delta\text{Measure}_{i,t} = \ln(\frac{\text{Measure}_{i,t}}{\text{Measure}_{i,t-1}})$. 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 :

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

We use the turnover and Amihud measure as a daily trading measures separately. For both measures we control for lead and lag changes in the two portfolio and market's measures. In addition,for turnover measure, we use size of the firm and Amihud, we include lead, lag, and contemporaneous market returns, contemporaneous firm return squared. [Table 3,4]

Table 3: 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***	0.396***	0.360***	0.425***	0.388***	0.448***
	(12.25)	(10.74)	(7.62)	(12.08)	(8.23)	(12.20)
$\Delta\text{TurnOver}_{\text{Group}}$			0.222***	0.229***	0.253**	0.268***
			(3.46)	(4.09)	(3.28)	(3.82)
$\Delta\text{TurnOver}_{\text{Industry}}$	0.120**	0.0205	-0.0156	-0.0237	-0.0833	-0.0999
	(3.25)	(0.24)	(-0.23)	(-0.42)	(-1.04)	(-1.46)
Observations	293264	292179	184699	183442	184699	183442
Weight	-	-	MC × CR	MC × 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

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

Table 4: cross-sectional average of the time-series coefficients for daily changes in illiquidity

	Dependent Variable: ΔAmihud_i					
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta\text{Amihud}_{\text{Market}}$	0.290***	0.298***	0.365***	0.234***	0.373***	0.244***
	(9.76)	(3.38)	(11.12)	(5.29)	(11.48)	(5.70)
$\Delta\text{Amihud}_{\text{Group}}$			0.182***	0.167***	0.161**	0.148**
			(3.58)	(3.86)	(2.93)	(3.11)
$\Delta\text{Amihud}_{\text{Industry}}$	0.0687*	0.144	0.00964	-0.0107	0.0162	-0.00565
	(2.02)	(1.59)	(0.19)	(-0.25)	(0.30)	(-0.12)
Observations	293264	291933	184699	183301	184699	183301
Weight	-	-	MC × CR	MC × CR	MC	MC
Control	No	Yes	No	Yes	No	Yes
R^2	0.118	0.223	0.219	0.320	0.224	0.324

t statistics in parentheses

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

Table 5: Pairwise correlation in turnover

	Dependent Variable: Future Monthly Correlation of Delta turnover						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Same Group	0.0134**	-0.00613*			-0.0102***	-0.00763	-0.00600
	(3.13)	(-2.20)			(-3.81)	(-1.75)	(-1.36)
FCA*			0.00784***	0.00308**	0.00389***	0.00410***	0.00304*
			(4.71)	(3.39)	(4.29)	(4.07)	(2.23)
(FCA*) × SameGroup						-0.00244	-0.00104
						(-0.82)	(-0.33)
Observations	378502	370726	378502	370726	370726	370726	370726
Group Effect	No	No	No	No	No	No	Yes
Controls	No	Yes	No	Yes	Yes	Yes	Yes
R^2	0.000603	0.00766	0.00110	0.00774	0.00806	0.00827	0.0236

t statistics in parentheses

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

Table 6: Pairwise correlations in liquidity

	Dependent Variable: Future Monthly Correlation of Delta Amihud						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Same Group	0.0116**	-0.00482			-0.00853*	-0.00595	-0.00739
	(2.76)	(-1.64)			(-2.49)	(-1.32)	(-1.85)
FCA*			0.00650***	0.00303***	0.00363***	0.00384***	0.00289**
			(6.09)	(4.52)	(4.31)	(4.26)	(2.89)
(FCA*) × SameGroup						-0.00274	-0.00162
						(-1.10)	(-0.70)
Observations	377863	369768	377863	369768	369768	369768	369768
Group Effect	No	No	No	No	No	No	Yes
Controls	No	Yes	No	Yes	Yes	Yes	Yes
R^2	0.000586	0.00615	0.000681	0.00610	0.00654	0.00673	0.0220

t statistics in parentheses

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

Figure 1: Time series of average common ownership measure with 95 percent interval for all pairs

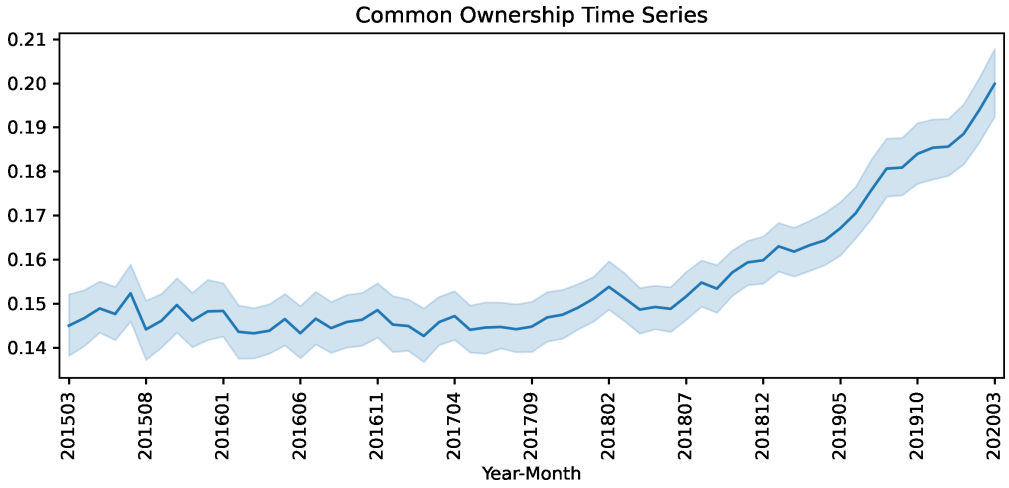

Figure 2: Time series of average common ownership measure with 95 percent interval in pairs in the same business group and others

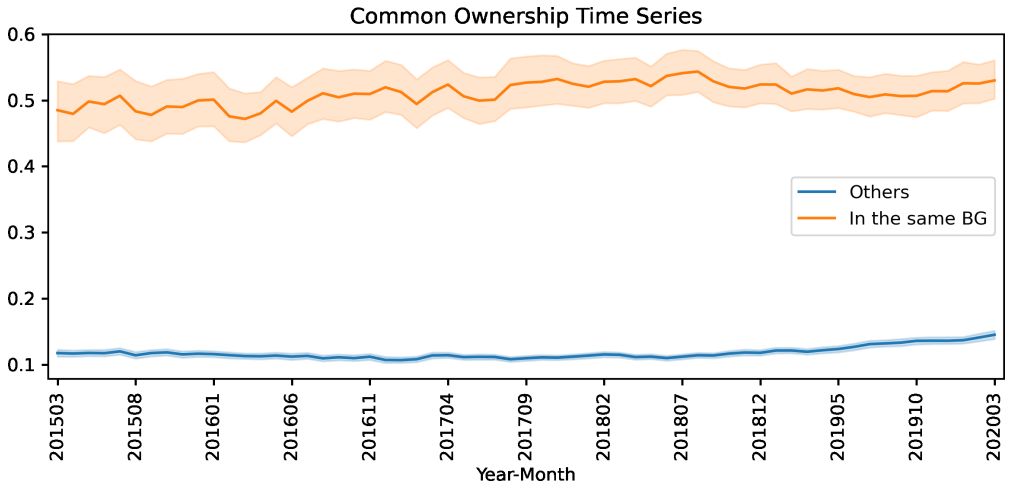

Figure 3: Time series of average common ownership measure with 95 percent interval which is grouped based on pairs' size

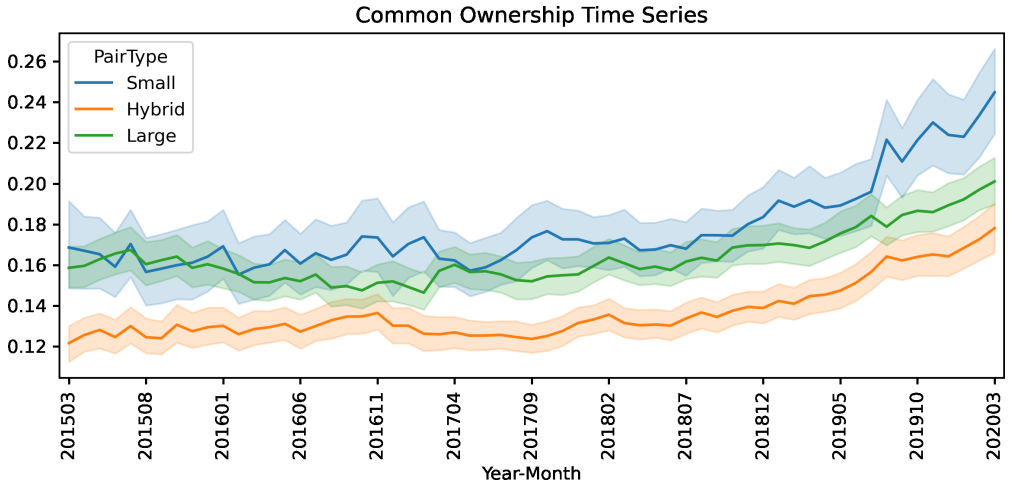

Figure 4: Percent of group affiliated firms from listed firms

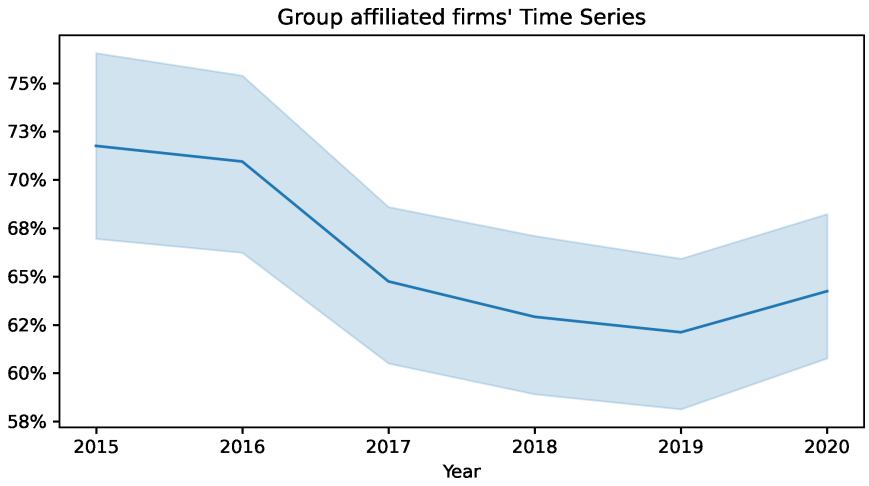

Figure 5: Percent of group affiliated firms from marketcap