How Chief Financial Officer's Social Networks Reduce Corporate Misconduct: Evidence from China

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Abstract. Based on the data of Chinese A-share listed firms from 2007 to 2022, this paper exhaustively analyzes the impact of the CFO social network on firm misconduct and its internal mechanism. The empirical results show that the role of CFOs is very significant, and the higher their centrality, the fewer firm misconducts. Several tests, such as PSM regression have rigorously verified this observation. Further mediation tests find that CFO social networks have information and resource paths that strongly curb firm misconduct. The research results of this paper not only enrich the theory of social networks and corporate misconduct but also provide a new perspective for the supervision of the capital market. The firm should pay attention to the construction of the CFO's social network, strengthen its central position, and play its effect in preventing the occurrence of corporate violations.

Keywords: Firm misconducts; CFO; Interlocking network; Network centrality.

1 Introduction

In recent years, misconduct by listed firms in China has occurred frequently, seriously infringing on the legitimate rights and interests of investors and the firm image. According to the data, it is found that during the period from 2007 to 2022, a total of 39,114 misconduct have occurred in listed firms in China's stock market, with an average of about 3,000 cases per year. These misconducts cover inaccurate release of information, irregular operation of related transactions, misuse of funds, etc., leading to direct economic losses to investors and also posing a threat to the stability of the financial market.

Existing literature analyzes the drivers of firm non-compliance from various perspectives such as firm characteristics (Jones, 2011)[1], firm governance (Liao et al., 2019[2]; Lyu & Zhang, 2024[3]), and top management characteristics (Rijsenbilt and Commandeur, 2013[4]). For example, Lyu & Zhang (2024)[3] found that Re-election of independent directors increases the probability of corporate misconduct. Wu et al (2023)[5] investigated the role of employee stock ownership plans in the governance of firm non-compliance. And Sargiacomo et al (2024)[6] explored the roles and functions played by auditors in preventing firm misconduct. While the above are the effects of

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formal institutions on firm non-compliance, as informal institutions, social networks can play a key role in firm operations. For example, Wang et al. (2023)[7] find that Alumni relationships between a firm's directors and auditors can promote earnings management by the firm. Cai et al (2021)[8] find that when independent directors have political connections, it helps curb firm misconduct. In the context of China, social relationships are even more important to be ignored. CFOs, as members of the core management, play a crucial role in firm finance and firm governance. So this paper focuses on exploring the effect of CFOs' social networks on firm irregularities. This study is expected to advance the impact of firm governance and show new perspectives on the regulation of the securities market.

2 Research Hypothesis

Compared with other top managers, CFOs have higher status and decision-making power in firm finance (Kathy et al., 2018[9]; Anderson et al., 2024[10]). They not only have full control of firm financial information but also have the same right to play a role in firm strategic decisions. Therefore, the CFO's characteristics and behaviors have an important impact on firm misconduct. Especially when the CFO enhances his or her power position through the extensive social network established by holding positions in other firms. In social network analysis, Betweenness centrality is an indicator for assessing the importance of an individual's position in the social network (Freeman, 1978[11]). The greater the betweenness centrality, the more the individual's position in the network is emphasized, meaning that they have control over information and resources (Bakke et al., 2024[12]). CFO's social connections and their influence not only help to obtain external resources but also make it possible to collect many important external news. Therefore, the centrality of the CFO's interlocking network centrality may play a role in firm misconduct through both information and resources.

For the information channel mechanism, the higher the CFO's interlocking network intermediary centrality, indicating that his bridge position in the social network is more prominent. The so-called "bridge" role refers to the fact that other firms must pass through the current firm to communicate and cooperate (Nikiforou et al., 2020[13]). The bridge position helps the CFO to obtain critical information about the outside world, including market changes, policy updates, and practices of peer firms. Such information helps CFOs to more accurately foresee the potential risks of non-compliance and implement preventive strategies promptly, thus reducing the occurrence of non-compliance. At the same time the bridge position makes the CFO more effective in the organization's internal dissemination of compliance awareness of the ability to improve the understanding of the top management of laws and regulations, and therefore constraints on firm non-compliance.

For the resource channel mechanism, when CFOs have higher interlocking network centrality, they hold more resources in the social network. Such social resources are conducive to CFOs to raise funds more effectively and alleviate the firm financing constraints. Therefore, it reduces the irregularities taken due to the pressure of capital and prevents the firm's irregularities from the source. At the same time, rich social resources

can also bring more complete legitimacy support for the firm, such as relying on the guidance and advice of professionals, improving the internal control system, and so on, to prevent the occurrence of irregularities. In summary, the CFO's interlocking network position may form the effect of inhibiting firm misconduct by improving the information and resource channels of the firm. This paper puts forward the following hypotheses:

H1: CFO's interlocking network centrality is significantly negatively correlated with firm misconduct.

3 Research Design

3.1 Data Source and Sample Selection

In this paper, the research sample is selected to be Chinese listed firms from 2007 to 2022. In the process of sample selection, the following criteria are followed: (1) Excluding firms in the financial industry due to the specificity of the financial industry; (2) Excluding firms with missing data required for the study. (3) Deal with outliers by winsorizing all continuous variables at the 1% level. The firm misconduct data used in this paper are from WINDS database, the control variables data are from CSMAR database, and the CFO's interlocking network data are based on the original data downloaded from WINDS through manual collation and calculation.

3.2 Model and Definition of Variables

In order to test hypothesis 1, model 1 is constructed in this paper:

$$Firm\_Misconduct_{it} = \beta_0 + \beta_1 CFO\ Network + \sum Control\ \text{var}iables \quad (1)$$

Firm misconduct, the amount of misconduct of executives reflects the degree of misconduct of the firm, this paper will logarithmize the amount of misconduct of executives as a proxy variable for firm misconduct.

CFO Interlocking Networks, in social network analysis theory, betweenness centrality measures the bridging role that an individual plays in a network. Higher values of betweenness centrality indicate that more firms need to rely on the current firm to establish cooperative relationships with other firms. Therefore, high betweenness centrality implies having more master control over information and resources. In this paper, the standardized CFO interlocking network betweenness centrality is used as a proxy variable for CFO network. The specific formula is:

$$Betwenness_i = \sum_i^n g_{jk}(n_i) / g_{jk} \quad (2)$$

Where j and k represent any two firms in each of the two networks. g_{jk} represents the shortest distance between the two firms. $g_{jk}(n_i)$ represents the number of paths that pass through the current firm among all the shortest paths. To eliminate the effect of magnitude, the centrality will be divided by the maximum value of each year to reduce the variation of the size of the network in each year. The paper also controls for a range of firm characteristics and firm governance variables, including firm size, gearing, profitability level, nature of ownership and board size, among others. They are not further defined due to the limited space of the paper.

3.3 Descriptive Statistics

Table 1 reports the results of the descriptive statistics for the main sample. The mean of Firm_Misconduct is 0.02 and the standard deviation is 0.188, suggesting that there is a large variation between firm's misconduct. The mean of CFO network is 0.001, suggesting that there are relatively few CFOs occupying bridge positions in the network. The means and standard deviations of the other variables are consistent with other papers.

Table 1. Descriptive statistics

Variable	N	Mean	SD	Min	Max
Firm_Misconduct	35324	0.020	0.188	0	1.792
CFO network	35324	0.001	0.026	0	1
ROA	35324	0.038	0.061	-0.254	0.198
Lev	35324	0.430	0.204	0.0510	0.896
Size	35324	21.50	1.447	18.38	25.57
SOE	35324	0.402	0.490	0	1
Dual	35324	0.263	0.440	0	1
LOSS	35324	0.103	0.304	0	1
Board	35324	2.250	0.177	1.792	2.773
TobinQ	35324	2.022	1.263	0.854	8.417
TIns	35324	46.26	25.27	0.350	95.24
Cflow	35324	0.048	0.070	-0.172	0.248
Cash	35324	0.199	0.143	0.016	0.733

4 Empirical Results

4.1 Basic Regression and the Robustness Test

Table 2 reports the results of the benchmark regression and the robustness regression of CFO network centrality on firm misconducts. In that, Columns 1 and 2 are the results of the benchmark regression, where the former has only the regression of the explanatory variables on the explanatory variables, while the latter add the other control varia-

bles, including year and industry. From the regression results, the regression coefficients of Column 1 and Column 2 are -0.025 and -0.020, respectively, and both of them are significant at the 1% level. It indicates that the CFO network centrality significantly reduces the degree of firm non-compliance. In terms of the economic significance of the regression results, column 2, after controlling for the effects of firm characteristics, firm governance characteristics, industry, year, etc., for every standard deviation increase in CFO_network, Firm_Misconduct is reduced by approximately 0.4 percentage points, which is equivalent to 18.8% of the sample mean of firm misconducts.

Considering that omitted variables can affect the regression results, and in order to eliminate heterogeneity bias in the observations, column 3 in Table 1 further controls for firms' individual effects. Individual fixed effects are able to control for the time-invariant characteristics of the firms themselves, and can more accurately identify the causal relationship between the explanatory variables and the explained variables. The coefficient of CFO network in the individual fixed effects model is -0.075, which is significant at the 10% level, and the regression results still support the hypothesis of this paper.

There may also be endogeneity issues between the explanatory and the explained variables. In order to address the impact of endogeneity on the regression results, this paper uses the PSM method to conduct further robustness tests. In the first stage of PSM, the propensity score is calculated using probit regression with the CFO network as the dependent variable, and a 1:1 nearest neighbor matching is performed based on the obtained propensity score value. In this, the binary variable of the CFO network needs to be constructed by dividing CFO network into three equal parts, assigning the first third as 1 and the second third as 0. In the first stage of PSM, the test of balance is important . Only if the variables are not significantly different in the control and treatment groups, it can be said that the sample selection for PSM is balanced. The results of the balance test in the first stage of PSM are presented in Figure 1. The black dots represent the deviations for each variable for the control and treatment groups before matching, while the deviations after matching are indicated by asterisks. The closer the black dot or asterisk is to the middle center line, the smaller the standardized deviation between the two groups. As can be seen in Figure 1, all the star points are closer to the center axis than the black points, indicating a balanced sample match in the first stage of the PSM. Column 4 of Table 1 presents the second-stage regression results of PSM, controlling for a range of control variables including industry and year. The regression coefficient is significant, further indicating that the CFO network is able to deter firms from non-compliance to some extent.

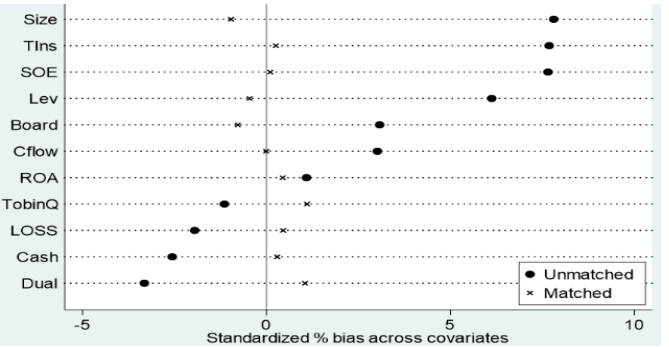

Fig. 1. Phase 1 of the PSM

Table 2. Regression results of PSM

	(1)	(2)	(3)	(4)
	Firm_Misconduct	Firm_Misconduct	Individual fixed effect	PSM
CFO_network	-0.025***	-0.020***	-0.075*	-0.016***
	[-6.63]	[-4.40]	[-1.83]	[-3.89]
ROA		-0.068*	-0.005	-0.040
		[-1.85]	[-0.16]	[-0.99]
Lev		0.036***	0.043***	0.026**
		[3.94]	[3.81]	[2.49]
Size		-0.002*	-0.005**	-0.001
		[-1.92]	[-2.22]	[-1.09]
SOE		-0.009***	-0.018**	-0.009***
		[-3.55]	[-2.51]	[-3.42]
Dual		-0.003	-0.003	-0.003
		[-1.05]	[-0.85]	[-0.97]
LOSS		0.013**	0.012**	0.006
		[2.26]	[2.48]	[1.01]
Board		-0.003	0.006	-0.005
		[-0.53]	[0.58]	[-0.67]
TobinQ		0.004***	0.001	0.001
		[3.16]	[1.20]	[1.10]
TIns		-0.000***	-0.000***	-0.000**
		[-2.68]	[-2.79]	[-2.09]
Cflow		0.017	0.014	0.022
		[0.92]	[0.76]	[1.04]
Cash		-0.013*	-0.017	-0.018**
		[-1.68]	[-1.49]	[-2.12]
_cons	0.030	0.081*	0.105*	0.016
	[0.73]	[1.70]	[1.91]	[0.67]
Year fixed effects	NO	Yes	Yes	Yes
Industry fixed effects	NO	Yes	Yes	Yes
Firm fixed effects	NO	NO	Yes	Yes
N	37763	35324	35324	23504
R^2	0.003	0.008	0.007	0.006

4.2 Mediation Analysis

Table 3 report the result of mediation analysis. According to the theoretical analysis above, CFOs can obtain more information and resources by occupying a bridge position in the interlocking network. Therefore, the higher the degree of information asymmetry and financing constraints, the more effective of the CFO's network position. In this paper, we refer to Hutton et al. (2009)[14] and use the sum of the absolute value of a firm's manipulative accruals over the past three years to measure the information transparency of listed firms. That is, the larger the Opaque, the lower the information transparency of the firm. And we refer to Hadlock & Pierce (2010)[15] to construct the SA variable to measure the degree of firms' financing constraints. CFO_network_Opaque and CFO_network_SA are the interaction terms of CFO network and information asymmetry and financing constraints, respectively. Table 2 reports the regression results of the interaction terms, and due to space constraints, only the results of the main variables are reported. As can be seen from the table, the coefficients of both interaction terms are significantly negative, indicating that the CFO network is inhibiting firms' degree of non-compliance through the information and resource channels.

Table 3. Mediation analysis

	(1) Firm_Misconduct	(1) Firm_Misconduct
CFO_network	-0.029***	-0.018***
	(-4.208)	(-3.806)
CFO_network_Opaque	-36.844***	
	(-3.081)	
CFO_network_SA		-18.458***
		(-4.485)
Opaque	0.010	
	(0.694)	
SA		0.012***
		(2.629)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
N	24729	35303
R^2	0.007	0.007

5 Conclusion

In the context of China's relational society, this paper investigates the role of CFO social networks in China's listed firms in inhibiting firm non-compliance over the period 2007-2022. The study finds that, for the first, the more central the CFO's position is in the social network, the less aggressive the firm is in terms of non-compliance. Second, when the firm's information asymmetry is greater, the more significant the effect of the CFO network in suppressing firm misconducts is, suggesting that CFOs suppress firm

misconducts through the information pathway. Third, when the firm's financing constraints are more severe, the more significant the effect of the CFO network in suppressing firm misconducts. This suggests that CFO networks alleviate financing constraints through the resource channel, thereby reducing the incentives for firm financial misconducts at the source.

Based on the above findings, this paper has the following insights: first, firms should encourage CFOs to expand their social relationships through interlocking tenure, joining alumni associations and participating in industry forums. By enhancing the CFO's social network position, it not only brings scarce information and key resources to the firm, but also improves the firm's compliance level. Second, firms should strengthen the construction of their own information disclosure level, reduce information asymmetry to strengthen external supervision, which helps to inhibit firm misconducts. Third, regulators can promote the transparency of firm information and the optimization of the financing environment through policy guidance and regulatory instruments to further bring into play the positive role of CFO social networks in curbing firm noncompliance.

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