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Board competence and bank performance in China

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Abstract

We incorporate econometrics approach into panel data methods to examine the impact of the board competence on the performance in Chinese banks. By investigating the biographical background of directors in the 20 largest banks during the period 2008 to 2016, our estimate shows that the board of directors play a prominent role in the performance. Especially, both the education background and the management experience have negative impact on the performance.

1. Introduction

Directors play a prominent role in Chinese banking governance (Liang *et al.*, 2013). Prior works discuss the role of directors in the banking sector in western countries (García-Meca *et al.*, 2015; Bhagat and Bolton, 2013; Andres and Vallelado, 2008) and also those in China (Liang *et al.*, 2013), yet scant researchers considers the influence from board competence on bank performance in recent years.

Our aim is to examine the effects of the boardroom competence on the performance of China's commercial banks in the years 2008 and 2016. Firstly, we investigate the biographical background of directors through their resume principally from each annual report in the 20 largest commercial banks, then evaluate their boardroom competence. Meanwhile, we use Stochastic Frontier Analysis to estimate profit efficiency scores (EFF). Both outcomes and two accounting ratios, namely ROA and ROE, are then employed in the dynamic panel models to estimate the impact of boardroom competence on bank performance. Our results indicate that stronger financial experience seem to be associated with better bank performance. On the other hand, we find that education background and management experience have a negative effect on the performance. Overall, our evidence shows that boardroom competence has an influence on Chinese bank performance.

Our research contributes to the existing literature by providing new evidence on the impact of boardroom on the performance of Chinese banking sector in the years 2008 and 2016. Not only accounting ratios are employed in our research but also profit efficiency score is introduced to stand for the performance (Berger *et al.*, 2014). Secondly, we manually collect a unique database regarding board competence and characteristics from annual reports of the twenty banks during 2008 and 2016. The third contribution lies in providing useful insights for policy makers in transition countries.

The paper is organized as follows. Section 2 reviews the literature and develops our research hypothesis. In section 3, we discuss the data and research methodology. Section 4 reports our main results and the final section concludes our research.

2. Literature Review

Much of the corporate governance literature in Chinese banks focus on the impact of ownership structure on bank performance (Mamatzakis *et al.*, 2017; Berger *et al.*, 2009; Lin and Zhang, 2009; Gillan, 2006). Empirical research shows that the board of directors might play a prominent role in the performance of Chinese banks. Regarding board characteristics, Liang *et al.* (2013) employ a sample of 50 largest Chinese banks from 2003 to 2010. The authors find that board characteristics are of importance as they impact upon both bank performance and asset quality. Moreover, Dong *et al.* (2017) based on a sample of 105 Chinese banks in the years 2003 to 2011 also report that board characteristics have an impact on bank performance. Finally, we highlight a related paper by Hau and Thum (2009), which investigates the biographical background of directors in the 29 largest banks and directly examines the relationship between boardroom competence and bank losses. Therefore, it is reasonable to assume that boardroom competence in Chinese banks could have an impact on the bank performance.

The general hypothesis here is: The boardroom competence is significantly related to bank

performance, where the board competence could be evaluated in three different dimensions, namely education background, financial experience, and management experience (Hau and Thum, 2009). Top managers play an important role in firm performance (Nadkarni and Herrmann, 2010). Jalbert *et al.* (2002) find an association between the educational background of the directors and Tobin's Q of the firm. Based on the discussion, the proposed hypotheses are as follow: **H1a(b)**: Education background of boardroom has a positive(negative) impact on bank performance. **H2a(b)**: Financial experience of boardroom has a positive(negative) impact on bank performance. **H3a(b)**: Management experience of boardroom has a positive(negative) impact on bank performance.

3. Data and Methodology

Detailed board data and financial information are manually collected from annual reports of each bank. Our sample comprises 180 yearly observations of the 20 largest banks, which contains five state-owned commercial banks, nine joint-stock commercial banks and five city commercial banks in the years 2008 to 2016. The proportion of these banks' total asset is 68.40% of whole China banking sector according to the China Banking Regulation Commission ranking in 2016.

Table 1 Descriptive statistics of main model variables

Variable	Obs	Mean	Std.Dev.	Min	Max
Panel A: Bank performance					
ROA	180	1.070	0.220	0.150	1.500
ROE	180	18.48	3.785	4.180	35.77
EFF	168	0.748	0.193	0.221	0.984
Panel B: Board competence					
E_s	177	1.944	0.313	1.080	3.410
F_s	177	2.008	0.348	0.850	2.720
M_s	177	3.269	0.359	2.070	4
Panel C: Bank size & Board characteristics					
FS	176	14.61	1.281	11.34	17.00
BS	180	15.70	1.926	9	19
IND	180	0.342	0.0620	0.170	0.500
WD	180	0.137	0.0854	0	0.400
CB	180	0.0688	0.0769	0	0.290
PB	177	0.500	0.183	0.0800	1
BD	177	0.365	0.210	0	0.890
Panel D: Year by year board competence					
year		E_s	F_s	M_s	
2008		1.931	1.987	3.232	
2009		1.858	2.049	3.332	
2010		1.893	1.915	3.194	
2011		1.936	2.023	3.217	
2012		1.919	2.063	3.289	
2013		1.904	2.049	3.278	
2014		1.990	1.994	3.254	
2015		2.024	1.976	3.295	
2016		2.038	2.016	3.325	

Source: Manually collected from annual reports of each bank

Note: The table shows summary statistics of main model variables. The sample is a strongly balanced panel covering 20 Chinese banks in the year 2008 and 2016. In panel A, ROA refers to return on assets, ROE refers to return on equity and EFF¹ denotes profit efficiency scores; E_s, F_s and M_s (boardroom competence) respectively stand for education background, financial experience and management experience in Panel B; Panel C includes FS(Bank Size), BS(The number of directors in the board), IND(The percentage of independent directors), WD(The percentage of female directors), CB(The percentage of foreign directors), PB(The percentage of directors who used to work in government) and BD (The percentage of directors employed in more than three enterprise, ">=3").

¹ Note that we estimate profit efficiency scores using Stochastic Frontier Analysis. Moreover, we employ profit defined by pretax profits of the bank *i* at year *t*. Our research follows the intermediation approach, suggested by Sealey and Lindley (1977), to define the inputs and outputs.

² $E_s = E_1 + E_2 + E_3$, $F_s = F_1 + F_2 + F_3$, $M_s = M_1 + M_2 + M_3 + M_4$. In addition, each indicator of them is measured, as explained in Table 2.

Table 2 Measurement of indicators in independent variables

Indicators	Measurement
<u>Education background</u>	
E1	A binomial indicator that takes the value of 1 if the director has obtained a bachelor's degree, and 0 otherwise.
E2	A binomial indicator that takes the value of 1 if the director has obtained a master's degree, and 0 otherwise.
E3	A binomial indicator that takes the value of 1 if the director has obtained a PhD degree, and 0 otherwise.
<u>Finance experience</u>	
F1	A binomial indicator that takes the value of 1 if the director has worked in bank sector, and 0 otherwise.
F2	A binomial indicator that takes the value of 1 if the director has worked in financial market or related business, and 0 otherwise.
F3	A binomial indicator that takes the value of 1 if the director has already worked in the current bank, and 0 otherwise.
<u>Management experience</u>	
M1	A binomial indicator that takes the value of 1 if the director has already worked as a mid-manager, and 0 otherwise.
M2	A binomial indicator that takes the value of 1 if the director has already worked as a top-manager, and 0 otherwise.
M3	A binomial indicator that takes the value of 1 if the director has already worked as a top-manager in the current bank, and 0 otherwise.
M4	A binomial indicator that takes the value of 1 if the director has already worked as a manager in more than one company, and 0 otherwise.

Next, we firstly employ two accounting ratios, to estimate the impact of board competence on bank performance, using control variables such as board characteristics and bank size. To explore this relationship, we adopt the following model:

$$Performance_{i,t} = \alpha_0 + \beta_j \sum_{j=1}^n Board\ competence_{i,t} + \gamma_j \sum_{j=1}^n Control_{i,t} + \varepsilon_{i,t} \quad (1)$$

where i identifies the cross-sectional dimension across Chinese banks, and t represents the longitudinal-sectional dimension in the years 2008 to 2016. $Performance_{i,t}$ is the dependent variable, which is alternatively two accounting ratios. $Board\ competence_{i,t}$ denotes one of the three board competence variables. $Control_{i,t}$ is a set of control variables, which will be also discussed in empirical results section.

Finally, we adopt dynamic generalized method of moments (GMM) approach to resolve the potential problem of endogeneity in the further research. Hence, we regress profit efficiency scores on a set of board competence and control variables, as follows:

$$Performance_{i,t} = \alpha_0 + \alpha_1 \sum_{v=1}^m Performance_{i,t-v} + \beta_j \sum_{j=1}^n Board\ competence_{i,t} + \gamma_j \sum_{j=1}^n Control_{i,t} + \varepsilon_{i,t} \quad (2)$$

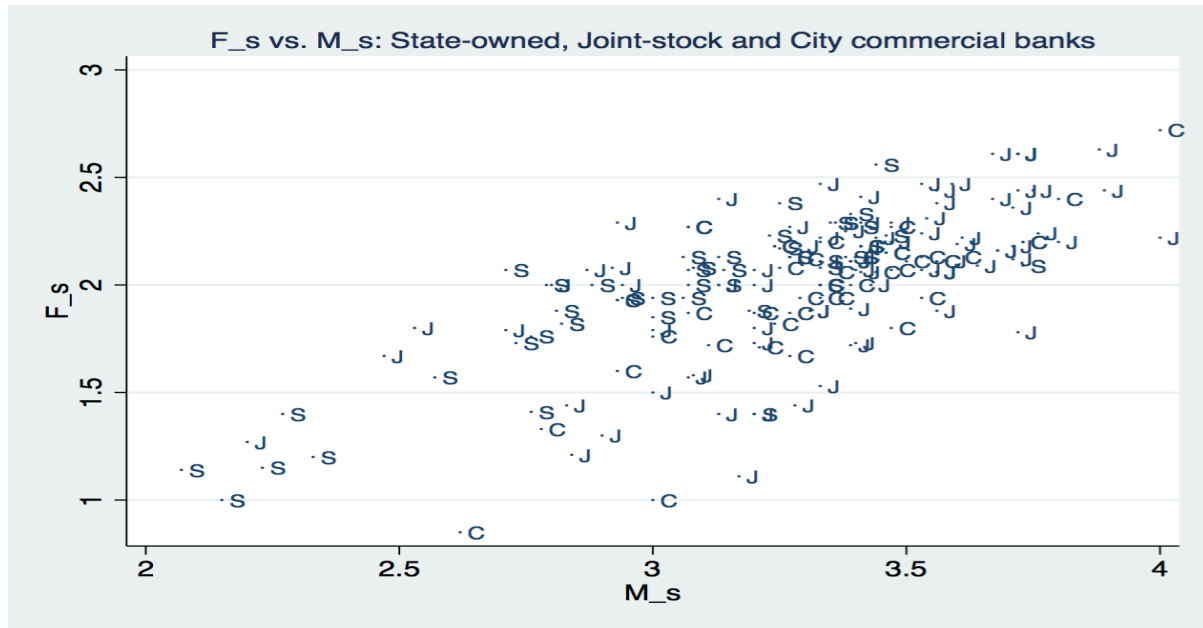
where $Performance_{i,t}$ denotes bank performance which is profit efficiency scores or two account ratios, $Board\ competence_{i,t}$ accounts for the three board competence variables, and $Control_{i,t}$ is a set of control variables. Specially, $Performance_{i,t-v}$ stands for the v lagged performance dependent variable.

4. Empirical Results

Figure 1 presents the boardroom competence concerning financial experience and management experience in the twenty Chinese commercial banks. No obvious distinct among types of banks are displayed. Turning to boardroom competence (E_s, F_s and M_s), we found that the correlation between F_s and M_s across these banks, that is same as that of German bank management (Hau and Thum, 2009).

³ In determining the regression model, we respectively perform the LM test and Hausman test. The former test results (Prob > chi2 = 0.0000) show that we should not employ pooled regression; The second test results as dependent variable is ROA (Prob > chi2 = 0.7794) show that we should not use fixed effect model.

Figure 1 F_s vs M_s: State-owned, Joint-stock and City commercial banks



Note: Figure 1 presents the boardroom competence concerning financial experience and management experience in the twenty Chinese commercial banks. Moreover, “F_s” and “M_s” (boardroom competence) respectively stand for financial experience and management experience. “S” stands for state-owned banks, “J” denotes state-owned banks, and “J” stands for city banks.

4.1 Static Panel Estimation

Table 3 & Table 4 display the results of regressing two accounting ratios on a set of board competence including control variables, namely board characteristics and bank size. Moreover, LM test (Breusch and Pagan, 1980) rejects Pooled OLS method in favor of random effect method when the dependent variables is ROA or ROE. Meanwhile, Hausman test rejects fixed effect method, when the dependent variable is ROA; However, Hausman test accept fixed effect estimation, when the dependent variable is ROE.

As shown from following results, we found that the effect of education background on ROA is negative. This finding partially supports the hypothesis *H1b*. On the contrary, increases in the financial experience seem to be associated with higher bank performance, based on evidences from the effect on both ROA and ROE. This finding is in line with another study that discovers a negative relationship between financial board competence and bank loses (Hau and Thum, 2009). Furthermore, the management experience has shown a significantly negative relationship with ROA at the 95% level (Table 3), and with ROE respectively at the 95% level (Table 4). The results support the hypothesis *H3b* that the management experience negatively impacts bank performance.

Table 3 Board competence and bank performance: Pooled OLS vs. Random Effect

VARIABLES	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROE	(6) ROE	(7) ROE	(8) ROE
E_s	-0.151** (0.0602)			-0.153*** (0.0590)	0.395 (1.191)			0.283 (1.176)
F_s		0.0582 (0.0363)		0.160*** (0.0567)		0.0693 (0.747)		2.443** (1.157)
M_s			-0.00243 (0.0437)	-0.158** (0.0679)			-1.376 (0.867)	-3.574*** (1.360)
BS	0.0188** (0.00781)	0.0168** (0.00788)	0.0172** (0.00794)	0.0175** (0.00765)	0.436*** (0.156)	0.443*** (0.155)	0.450*** (0.154)	0.426*** (0.154)
IND	0.0629 (0.244)	0.0755 (0.247)	0.0719 (0.249)	0.0865 (0.239)	-3.134 (4.922)	-3.110 (4.922)	-2.826 (4.886)	-2.229 (4.841)
WD	-0.355* (0.190)	-0.343* (0.193)	-0.365* (0.194)	-0.349* (0.187)	-1.473 (3.680)	-1.432 (3.694)	-1.620 (3.658)	-0.665 (3.665)
CB	-0.172 (0.265)	-0.362 (0.257)	-0.355 (0.259)	-0.276 (0.264)	4.461 (4.840)	4.967 (4.650)	4.600 (4.624)	3.465 (4.898)
PB	0.343*** (0.109)	0.398*** (0.112)	0.363*** (0.114)	0.337*** (0.111)	6.216*** (2.027)	6.227*** (2.062)	5.335** (2.085)	5.505*** (2.102)
BD	0.0542 (0.105)	-0.0189 (0.106)	0.00713 (0.110)	0.0966 (0.110)	1.827 (1.897)	1.885 (1.903)	2.794 (1.955)	3.306 (2.016)
FS	0.00312 (0.0236)	-0.0147 (0.0228)	-0.0146 (0.0230)	-0.00611 (0.0238)	-1.093*** (0.413)	-1.060*** (0.388)	-1.152*** (0.389)	-1.453*** (0.426)
Constant	0.880*** (0.338)	0.766** (0.350)	0.895** (0.386)	1.219*** (0.390)	24.08*** (5.816)	24.03*** (5.996)	29.96*** (6.810)	35.94*** (7.193)
Observations	173	173	173	173	173	173	173	173
Number of Banks	20	20	20	20	20	20	20	20
LM test	0.0000 (106.90)	0.0000 (105.15)	0.0000 (103.09)	0.0000 (111.84)	0.0000 (28.64)	0.0000 (29.12)	0.0000 (30.36)	0.0000 (32.41)
R-squared	0.178	0.166	0.151	0.223	0.246	0.247	0.253	0.282

Note: The table reports pooled OLS and random effect regression with ROA and ROE as dependent variables. In dependent variables, "ROA" refers to return on assets and "ROE" refers to return on equity; "E_s", "F_s" and "M_s" (boardroom competence) respectively stand for education background, financial experience and management experience; Control variables includes FS(Bank Size), BS(The number of directors in the board), IND(The percentage of independent directors), WD(The percentage of female directors), CB(The percentage of foreign directors), PB(The percentage of directors who used to work in government) and BD (The percentage of directors employed in more than three enterprise, ">=3").

***, **, * indicate significance at the 1%, 5%, 10% levels.

Table 4 Board competence and bank performance: Fixed Effect vs. Random Effect

VARIABLES	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROE	(6) ROE	(7) ROE	(8) ROE
E_s	-0.137** (0.0630)			-0.141** (0.0620)	0.491 (1.245)			0.359 (1.239)
F_s		0.0582 (0.0365)		0.160*** (0.0589)		0.116 (0.717)		2.025* (1.177)
M_s			0.00156 (0.0446)	-0.158** (0.0714)			-0.954 (0.865)	-2.892** (1.428)
BS	0.0187** (0.00809)	0.0180** (0.00815)	0.0182** (0.00822)	0.0173** (0.00797)	0.444*** (0.160)	0.445*** (0.160)	0.441*** (0.159)	0.421*** (0.159)
IND	0.105 (0.255)	0.130 (0.257)	0.127 (0.259)	0.105 (0.250)	5.043 (5.043)	5.043 (5.042)	5.043 (5.021)	5.047 (5.007)
WS	-0.412** (0.203)	-0.416** (0.204)	-0.436** (0.206)	-0.411** (0.200)	2.586 (4.009)	2.718 (4.013)	2.326 (4.001)	2.290 (3.992)
CB	-0.427 (0.305)	-0.589** (0.296)	-0.597** (0.300)	-0.464 (0.300)	5.032 (6.023)	5.662 (5.823)	5.237 (5.810)	4.274 (5.991)
PB	0.311** (0.123)	0.368*** (0.126)	0.332** (0.127)	0.322** (0.124)	6.510*** (2.433)	6.514*** (2.471)	5.891** (2.468)	6.133** (2.470)
BD	0.0373 (0.120)	-0.0511 (0.119)	-0.0239 (0.123)	0.0814 (0.124)	1.957 (2.374)	2.115 (2.338)	2.894 (2.394)	3.218 (2.473)
FS	-0.0245 (0.0291)	-0.0391 (0.0284)	-0.0404 (0.0287)	-0.0242 (0.0286)	-2.861*** (0.576)	-2.801*** (0.559)	-2.826*** (0.556)	-2.868*** (0.572)
Constant	1.293*** (0.420)	1.141*** (0.432)	1.280*** (0.459)	1.496*** (0.449)	47.61*** (8.299)	47.35*** (8.494)	51.26*** (8.899)	53.56*** (8.977)
Observations	173	173	173	173	173	173	173	173
Number of Banks	20	20	20	20	20	20	20	20
Hausman test	0.4575 (8.78)	0.3617 (9.86)	0.3592 (9.89)	0.7794 (7.24)	0.0006 (29.15)	0.0007 (28.67)	0.0012 (27.42)	0.0117 (24.26)
R-squared	0.188	0.176	0.161	0.228	0.295	0.294	0.300	0.315

Note: The table shows fixed effect and random effect regression with ROA and ROE as dependent variables. In dependent variables, "ROA" refers to return on assets and "ROE" refers to return on equity; "E_s", "F_s" and "M_s" (boardroom competence) respectively stand for education background, financial experience and management experience; Control variables includes FS(Bank Size), BS(The number of directors in the board), IND(The percentage of independent directors), WD(The percentage of female directors), CB(The percentage of foreign directors), PB(The percentage of directors who used to work in government) and BD (The percentage of directors employed in more than three enterprise, ">=3").

***, **, * indicate significance at the 1%, 5%, 10% levels.

For all models in Table 3 & Table 4, our research incorporates a set of control variables. Previous empirical research by Liang *et al.* (2013) and Dong *et al.* (2017) have documented board diversity significantly impact bank performance. Key findings of our results show that: board size has shown a significantly positive relationship with ROA at the 95%, and with ROE at the 99%.; the relationship between the women directors and ROA is negative. The coefficients on the political background directors are positive and economically significant for Chinese bank performance. In the same way, we find that firm size appears to impact ROE more than ROA.

Overall, our static panel estimations partially support the hypothesizes *H1b* and *H3b*, and fully support *H2a*. In addition, we find that the political background plays an important role in Chinese bank performance.

4.2 Dynamic Panel Estimation

Table 5 reports the system estimator regression results. We find the significantly negative relationship between the education background and EFF in model SysGMM1_3 (See 3rd column in table 5), and the significantly positive relationship between the financial experience and ROA in model SysGMM1_1(see 1st column in table 5). These findings alternatively support the hypothesizes *H1b* and *H2a*. Besides, Table 5 has shown that the significantly positive relationship between the board size and the two accounting ratios; The women directors has significantly positive impact on ROA and EFF; The country background also has significantly positive impact on the two accounting ratios; However, the political background has significantly negative impact on EFF.

Table 5 Board competence and bank performance: Dynamic panel estimation (2008-2016)

VARIABLES	(1) SysGMM1_1 ROA	(2) SysGMM1_2 ROE	(3) SysGMM1_3 EFF
Lag DEP	0.997*** (0.126)	1.028*** (0.142)	1.047*** (0.0772)
Lag2 DEP	0.0601 (0.175)	-0.272** (0.134)	0.507*** (0.129)
Lag3 DEP	-0.307*** (0.0666)	-0.123* (0.0682)	-0.577*** (0.0548)
Lag4 DEP	0.0726 (0.0518)	0.0686* (0.0406)	
E_s	0.00858 (0.0617)	1.009 (1.379)	-0.000860* (0.000491)
F_s	0.101* (0.0559)	1.644 (1.128)	0.000216 (0.000416)
M_s	-0.0990 (0.0652)	-1.252 (1.294)	-0.000546 (0.000503)
BS	0.0125* (0.00641)	0.432*** (0.117)	-1.81e-05 (3.38e-05)
IND	-0.0125 (0.305)	4.036 (4.483)	-0.000296 (0.00141)
WD	0.393* (0.212)	6.620 (4.950)	0.00234** (0.000983)
CB	0.696** (0.302)	10.01* (5.342)	-6.36e-05 (0.00163)
PB	0.131 (0.105)	3.036 (2.850)	-0.00124** (0.000568)
BD	0.134 (0.117)	1.576 (2.282)	0.000639 (0.000475)
FS	-0.0178 (0.0238)	-0.855 (0.661)	0.000110 (0.000140)
Constant	0.109 (0.534)	4.362 (12.68)	0.0242*** (0.00165)
Observations	99	99	103
Number of Banks	20	20	19
P-values	0.000	0.000	0.000
AR (1)	0.011	0.028	0.006
AR (2)	0.360	0.904	0.090
Sargan	0.216	0.112	0.476

Note: The table reports the results of one-step system GMM estimate of regressing two accounting ratios or EFF on a set of board competence and control variables. In dependent variables, "ROA" refers to return on assets, "ROE" refers to return on equity and "EFF" denotes profit efficiency scores; "E_s", "F_s" and "M_s" (boardroom competence) respectively stand for education background, financial experience and management experience; Control variables includes FS(Bank Size), BS(The number of directors in the board), IND(The percentage of independent directors), WD(The percentage of female directors), CB(The percentage of foreign directors), PB(The percentage of directors who used to work in government) and BD (The percentage of directors employed in more than three enterprise, ">=3").

***, **, * indicate significance at the 1%, 5%, 10% levels.

5. Conclusion

In this study, we examine the impact of boardroom competence on the performance of the China commercial banks in the year 2008 and 2016. We find that the financial experience is positively correlated with bank performance. Particularly, both the education background and the management experience have negative impact on bank performance. Overall, our evidence suggests that the boardroom plays a prominent role in Chinese bank governance, and the competence of directors affect bank performance.

One policy implication of our research is that "In the boardroom, the impact of professional ability on bank performance tends to have higher influence than that of basic skills on it." Besides, political background is still an important influencing factor to Chinese bank performance. Our new evidence sheds light on the relation between board competence and bank performance and provides useful insights for policy makers in transition countries.

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