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► **To cite this version:**

Rihem Braham, Lotfi Belkacem, Christian de Peretti. The role of political patronage on risk-taking behavior of banks in Middle East and North Africa region. 2018. hal-01762523

HAL Id: hal-01762523

<https://hal.science/hal-01762523v1>

Preprint submitted on 10 Apr 2018

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The role of political patronage on risk-taking behavior of banks in Middle East and North Africa region

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April 9th, 2018

Abstract

In the view of the growing interest in the role of political patronage in banking, several issues are highlighted with regards to performance and behavior of politically connected banks that may differ from their non-connected peers. In this article, the effect of political patronage on bank risk taking is examined by considering the ratio of loan loss reserves as measure of credit risk for a sample of 32 banks in some Middle Eastern and North African MENA countries. In general, we find that the presence of political patronage impact significantly bank risk, both directly and indirectly, consistent with our hypothesis that politically backed banks tend to exploit the moral hazard which, will cause them behave less prudently.

J.E.L classification: G21, G32, G34

Key words: political patronage, banks, risk taking, moral hazard, MENA

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1. Introduction

The “moral hazard” concept has been recently used to qualify the behavior of firms in terms of risk as they believe they would be rescued by the government. Faccio (2006) focus on the benefits of being politically connected such as extracting rents and having helping hand from the government. Inter alia, a greater expectation of receiving government bailout is an important gain of political connections. Otherwise, the idea of “too-big-to-fail” is nothing else but moral hazard. Large firms are more likely to be refloated by government under the “too big to fail” principle that aims to impede contagion by saving firms whose failure could imperil the whole financial system. So large firms are also more prone to be politically connected (Kostovetsky, 2015). Moreover, as government decisions can be influenced by political factors, politically connected companies tend to capitalize on the “moral hazard” which motivate them to take more risk.

The way in which banks perceive risk changing is a key determinant of their prudential behavior. For financial participants, it is very important to apprehend the risk of bank. Although risk is often seen as a negative aspect of a bank business, it is vital for the banks future profitability. According to Haq and Heaney (2012), the evaluation of overall risk of bank is important for regulators, bondholders and shareholders. An imprudent risk-taking can have serious consequences. When things go away from the appropriate path, the results lead to huge losses or even to a bank bankruptcy.

In this article, we focus on a negative side of political connections in support of the “moral hazard” perspective, the incentives that they create for firms to take more risk and reduce their prudential behavior. Dam and Koetter (2012) find that risk taking by German banks responds to changes in the expectations of government bailout from political connections. Similarly, Mariathan et al. (2014) provide evidence that implicit government guarantees for banks lead to risky financing and investment choices. Recently, Ashraf (2017) extends this finding in the way that higher political constraints increase moral hazard problems.

A pioneer work related to political connections, Gomez and Jomo (1997) defines political patronage as preferential treatment given to businessmen who are either politicians or politically connected to government. Faccio (2010) find that the financial characteristics of connected firms vary from those of their non-connected counterparts and that the influence of political patronage is more pronounced in emerging countries characterized by high levels of corruption and less developed financial system.

Therefrom, we argue that the Middle East and North Africa (MENA) setting may be of interest for several reasons. Firstly, the phenomenon of political patronage is common in the region illustrated by controlling families or regimes and political ties with the government. Besides, its impact is greatly identified in countries having high level of corruption and lacking of legal protection and strict regulations. Finally, as emerging stock markets in MENA region are still less developed, banks play an important role as a major source of financing, and further, on the entire economy by establishing the stability of financial system. Overall, the political and business infrastructure in this region allow politicians and Royal families to be involved in the ownership structure of banks. Hence, the following research question emerges: *Do political patronage affect bank risk taking in MENA region?*

Our findings are summarized as follows. First, politically connected banks take more risk than their non-politically connected counterparts. Second, when we consider both direct and indirect effects, the effect of political connection is no longer significant. However, its interactions with asset growth and capital respectively appear to be significant. In other words, there is an indirect and positive effect of political patronage on risk taking behavior of banks.

Our article adds to the literature in a number of ways. First, it contributes to a small literature which attempts to assess the impact of political factors on banks performance and financing (Braun and Raddatz, 2010; Carretta *et al.*, 2012; Jackowicz *et al.*, 2013, Hung *et al.*, 2017; Braham *et al.*, 2017) and depositor discipline (Disli *et al.*, 2013; Nys *et al.*, 2015) by exploring this impact on banks risk taking behavior. Second, this research extends the established body of literature on the value of political connections for firms (Faccio, 2006; Bliss and Gul, 2012; Lim *et al.*, 2012; Ebrahim *et al.*, 2014) to banking sector and more specifically in the MENA region context where this issue, to our knowledge, has not been addressed yet, otherwise, we extend the nascent research on risk-taking behavior of MENA banks (Srairi, 2013; Lassoued *et al.*, 2016). Finally, this research contributes to the methodology in prior studies on bank risk taking behavior. We go beyond evaluating the direct link between risk taking behavior and political patronage by examining possible indirect effects when interacting political patronage with other variables in the model.

The rest of the article is organized as follows: section 1 discusses the related literature and hypotheses; data and econometric method are described in section 2; section 3 reports the empirical results. Finally, the concluding remarks are presented in section 4.

2. Related literature on bank risk taking behavior

2.1. Literature on the impact of ownership

The risk-taking behavior in banking is important for shareholders and depositors as high level of risk taking generates conflicts of interests. Also, controlling for it is vital for the whole financial system.

In the literature related to banks' behavior, ownership structure is considered as an important factor influencing bank risk-taking. One of the pioneer works, Saunders *et al.* (1990) which investigates the relationship between risk taking by cross-section time-series regression for 38 bank holding companies and their ownership structures during the 1979-1982 period of relative deregulation and results suggest that stockholder-controlled banks to have an incentive to take greater risk than managerially controlled banks. The relationship between bank ownership structure and risk-taking is up to now barely examined. Berger *et al.* (2005) shows evidence that prudential behavior in lending activities improves after banks' privatization in Argentina in the 1990s. Similarly, Dinç (2005) provides empirical evidence about the political influences on banks in major emerging markets in the 1990s by comparing the different reactions of both types of bank to a political event, the regression analysis isolates political influences from many other differences between private banks and government owned banks and finds that state-owned banks increase their lending in election years compared with private. Besides, Jia (2009) studies the case of Chinese banks using firm-level data from 1985 to 2004 for 4 state-owned banks and 10 joint-equity by calculating three main ratios from portfolio allocation data such as the bank excess reserves ratio, loan/asset ratio and deposit/loan ratio as measures of bank prudence, and finds that state-owned banks are less prudent than joint-equity ones. Iannotta *et al.* (2013) uses a sample of large European banks and OLS regression analysis to evaluate the impact of government ownership on bank risk by comparing risk profiles (default risk and operating risk) of government-owned banks with respect to private owned banks and report that the former, benefiting from governmental protection, have lower default risk but higher operating risk than private banks, and this phenomenon tends to increase in election years. Sapriza *et al.* (2013) use a sample of international rated banks in cross-sectional estimations, results suggest that the intensity of government support, by providing explicit or implicit guarantees, is associated with more risk taking for banks. Dong *et al.* (2014) examines the impact of ownership structure on Chinese banks' risk-taking behavior based on the types of controlling shareholder by estimating ordinary least squares and the system Generalized Method of

Moments models and employing three proxies of risk taking (Z-score, ration of non-performing loans and the capital adequacy ratio), and find that banks controlled by the government tend to take more risks than those controlled by state-owned enterprises or private investors. Shaban and James (2017) investigates the effects of ownership change on the performance and exposure to risk of 60 Indonesian commercial banks over the period 2005-2012. Analyzing jointly the static, selection and dynamic effects of the major types of ownership in the same model of Berger *et al.* (2005), they find that state-owned banks tend to be less profitable and more exposed to risk than private and foreign banks.

2.2. Literature on MENA region

However, there are few studies focusing on the effect of banks ownership and risk taking in MENA region. For example, Srairi (2013) investigates the impact of ownership structure on bank risk of conventional and Islamic banks in 10 MENA countries over the period 2005-2009. Employing pooled regression models and two risk proxies (non-performing loans ratio and Z-score), the result shows a negative association between ownership concentration and risk. Also, state-owned banks display greater proportions of non-performing loans than other banks. Also, Lassoued *et al.* (2016) uses also pooled regression model for a sample of commercial MENA banks to study the impact of foreign and state ownership on banking risk during the period of 2006-2012 and show that state ownership encourages banks to take more risks while foreign ownership reduces risk-taking. More specifically, to our knowledge, there has been no attempt made to examine the impact of political connections as substitute for state-ownership on bank risk taking in this region, which this study attempts to pursue.

2.3. Literature on political connections

There is growing literature addressing the issue of political influence on financial system, including banks. For example, La Porta *et al.* (2002) examine a sample of banks operating in 92 countries around the world in regression analyzes and document that politicians use state-owned banks to achieve their own political goals. Also, Micco *et al.* (2007) argue that the difference in performance between state-owned banks and private-owned banks in developing and industrial countries is politically driven by using bank-level data for the period 1995-2002 to test whether political factors affects the relationship between ownership and performance. Moreover, Igan *et al.* (2011) examine how US financial institutions with lobbying performed in the 2000-2007 period and 2008 and find that they engaged in riskier lending practices than their non-lobbying peers prior to the financial crisis. A recent study of Eichler (2016)

examines the impact of many political factors such as electoral cycle and government power on bank default risk in Eurozone and find that these factors affect the stability of banks.

The use of political connections is one of these factors. For instance, Carretta *et al.* (2012) examine the impact political presence on the board of Italian cooperative banks in 2006 using series of regression models and argue that politicians having influential positions affect negatively bank activity measured by net interest revenue, loan portfolio quality and capitalization level. In this regard, political connections may be an issue of interest specifically for emerging markets. Recently, Braham *et al.* (2017) examine the impact of political patronage on a sample of commercial banks operating in MENA countries using panel estimation models and find that politically backed banks tend to have high leverage. However, there is a very small literature on the impact of such connections on bank risk taking. For example, Qian *et al.* (2015) use a sample of Chinese commercial banks during 2006-2010 in a regression model to analyze the relationship between political connections from the perspective of “officials-and-directors” and prudential behavior of banks using similar proxies to Jia (2009), results suggest that banks with such connections are less prudent. Besides, Dam and Koetter (2012) finds that risk taking of German banks is a function of bailout expectations as benefits from political connections by developing structural system of two equations that relates the probability of expected bailout and bank risk taking. This evidence is also supported by Kostovetsky (2015) who examines how political connections affect risk-taking behavior of US publicly traded financial firms from 1973 through 2009 by using geography-based measure. He finds that politically connected firms have higher leverage and their stocks have higher stock volatility and suggests that a “moral hazard-based theory” would predict that financial firms with better political connections should take on more risk.

Overall, while numerous studies have been carried out to examine the influence of different political factors on banking activities, we will focus on the special case of politically patronized banks. At the same time, the relationship between political patronage and firms’ performance in general and banks in particular has drawn a great attention from researchers and results are mixed due to different approaches and contexts. So, we propose to study the impact of the presence of political connections on risk taking in specific case of banking sector in MENA region’s context which, to our knowledge, has not been addressed yet. Hence, we test the hypothesis that politically patronized banks tend to take more risk. In addition, we hypothesize that the effect of political connections on bank risk may be indirect.

3. Data, variables and econometric method

3.1. Data and variables selection

We use unbalanced panel of annual data from 2003 to 2014 of 32 commercial banks operating in 6 MENA countries: Tunisia, Egypt, Lebanon, Jordan, Yemen and Iran. Financial data and key ratios are obtained from bank scope database. Besides, detailed information on political backgrounds are hand collected from individual biographies of banks board members.

We present in table 1 the variables used in the empirical analysis.

Table 1. Variables definition

variables		Definition	measurement
dependent variable	credit_risk	The risk of default measured by loan loss reserves ratio which reflects asset quality.	loan loss reserves/gross loans
Independent variables	pol	Political connections refer to banks which have at least one of their owners or directors who is a politician or former/current government official as well as cases of informal ties to a politician, minister or government official.	dummy equals to 1 if the bank is politically connected; 0 otherwise
	prof	Profitability measured by the ratio of return on average assets	net income/average of total assets
	cap	Capital as measure of financial leverage	equity/total assets
	eff	efficiency	cost / income
	liq	Liquidity refers to the extent to which customer deposits finance customer loans	loans/deposits
	size	Size of the bank	total assets
	ag	Asset growth	$(Asset_t - Asset_{t-1}) / Asset_{t-1}$
	op_lev	Operating leverage	fixed assets/total assets
	state	ownership (state or private-owned)	dummy equals to 1 if the bank is state owned; 0 otherwise

3.2. Econometric method

In order to test our hypothesis on the impact of political patronage on bank risk taking, we estimate Panel data linear regression:

$$\begin{aligned} credit_risk_{it} = c + \beta_1 pol_{it} + \beta_2 prof_{it} + \beta_3 cap_{it} + \beta_4 eff_{it} + \beta_5 liq_{it} + \beta_6 size_{it} + \beta_7 ag_{it} \\ + \beta_8 op_lev_{it} + \beta_9 state_{it} + \mu_i + \varepsilon_{it}, \end{aligned} \quad (1)$$

where i denotes bank ($i=1,2,\dots, 32$), t denotes year ($t=2003\dots 2014$), c is the constant term, $\beta_1\dots \beta_9$ are the parameters to be estimated, μ_i is the unobserved time-invariant individual effect and ε is the error term.

As a first step, in panel data, it appears necessary to verify the homogeneous or heterogeneous specification of the model to determine if the parameters are perfectly identical or vary across individuals. Under Stata, Fisher test with the null hypothesis of absence of individual effects is directly performed when running the fixed effect model estimation. Then, two panel estimation methods are performed using fixed effects and random effects models. Statistically, the Hausman (1978) test is done to select the appropriate method of estimation with the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator.

Furthermore, there may be indirect links between risk and political patronage through interactions with other variables of the regression. To examine these effects, we interact the variable of political patronage with each of the control variables, we also add the quadratic specification of the variable as in the following regression:

$$\begin{aligned} credit_risk_{it} = c + \beta_1 pol_{it} + \beta_2 prof_{it} + \beta_3 cap_{it} + \beta_4 eff_{it} + \beta_5 liq_{it} + \beta_6 size_{it} + \beta_7 ag_{it} + \beta_8 op_lev_{it} + \beta_9 state_{it} \\ + \delta pol_{it}^2 + \alpha_1 prof \times pol_{it} + \alpha_2 cap \times pol_{it} + \alpha_3 eff \times pol_{it} + \alpha_4 liq \times pol_{it} + \alpha_5 size \times pol_{it} \\ + \alpha_6 ag \times pol_{it} + \alpha_7 op_lev \times pol_{it} + \alpha_8 state \times pol_{it} + \mu_i + \varepsilon_{it}, \end{aligned} \quad (2)$$

where α and δ are the regression coefficients of independent variables.

The starting point is to estimate the initial specification including all variables. Then, based on statistical significance of the independent variables, we eliminate the less significant one and we repeat the procedure of estimation until we conclude with only significant variables.

3.3. Multicollinearity tests

Within the empirical framework, we present descriptive statistics and correlation analysis of the variables. In addition, multicollinearity tests are performed: First, the Variance Inflation

Factor (VIF) where the problem of multicollinearity is detected if VIF has a value of 5 or 10 and above and / or the average of VIF is greater than or equal to 2; Second, collinearity diagnostic procedures (BKW) proposed by Belsley, Kuh, and Welsch (1980) where the variance-decomposition proportions can be used to identify the source of collinearity associated with large value of condition indexes. According to Erkel-Rousse (1995), the threshold of 30 is representative of an “acute” situation of multicollinearity. In fact, a significant problem can be revealed when one or more condition indices have a value greater than or equal to 20. While, a situation of "light" multicollinearity is detected when the value of a condition index is greater than 10 or even 5. A situation where a condition index has a value greater than 30 and has on the corresponding line at least two proportions of decomposition of the variances greater than the value 0.5 is called "close dependence" and leads to the existence of a phenomenon of multicollinearity between the variables concerned.

4. Results

In this section, we present and analyze different estimations results in detail. However, it is necessary to conduct a preliminary analysis for the study sample.

4.1. Preliminary analysis

Table 2 provides the summary statistics (average, standard deviation, maximal value and minimal value) for the study sample period from 2003 to 2014, including all variables used.

Table2. Descriptive statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
credit_risk	306	9.308448	8.145424	.07	42.047
prof	335	1.139666	1.446619	-9.92	12.988
pol	359	.4401114	.4970932	0	1
size	335	39732.71	280624.3	.9618691	2999745
cap	335	10.07227	5.932866	-1.025	48.617
eff	335	52.79689	18.55263	14.463	179.31
liq	335	72.55561	59.76004	7.15	502.08
state	359	.1225627	.3283922	0	1
ag	327	15.28596	15.11906	-21.85	94.87
op_lev	334	.0173478	.0153186	.0018294	.1526072

We also conduct correlation analysis between each pair of the variables used in the study to make sure that none of them are highly correlated. Table 3 presents Pearson correlation coefficients and the level of statistical significance (p-value) based on its subsequent test with the null hypothesis that the correlation is not statistically significant. Credit risk is negatively correlated with all variables except for efficiency, state ownership and political patronage. Also, the results show that the coefficients of correlation do not exceed the value of 0.5, except for liquidity and capital, the correlation coefficient is 0.5690.

Table 3. Correlation matrix of variables

	Credit risk	prof	pol	size	cap	eff	liq	state	ag	op_lev
Credit_risk	1.0000									
prof	-0.2384	1.0000								
	0.0000									
pol	0.1064	0.0970	1.0000							
	0.0630	0.0762								
size	-0.1137	-0.0178	-0.1049	1.0000						
	0.0469	0.7460	0.0551							
cap	-0.1090	0.3556	-0.0561	-0.0552	1.0000					
	0.0569	0.0000	0.3063	0.3139						
eff	0.0305	-0.4993	-0.1843	0.0528	-0.1745	1.0000				
	0.5952	0.0000	0.0007	0.3352	0.0013					
liq	-0.0028	0.0608	-0.1014	-0.0361	0.5690	0.1578	1.0000			
	0.9606	0.2670	0.0638	0.5106	0.0000	0.0038				
state	0.1929	0.0214	-0.3314	-0.0470	0.0507	-0.0402	-0.0325	1.0000		
	0.0007	0.6959	0.0000	0.3909	0.3546	0.4634	0.5534			
ag	-0.1996	0.2710	-0.0818	0.0162	0.1877	-0.1156	0.2394	-0.1942	1.0000	
	0.0005	0.0000	0.1401	0.7700	0.0006	0.0367	0.0000	0.0004		
op_lev	-0.0049	0.0185	-0.1125	-0.0081	0.1214	0.2923	0.2363	0.0286	0.2124	1.0000
	0.9321	0.7366	0.0399	0.8831	0.0265	0.0000	0.0000	0.6024	0.0001	

This table lists the p-value of the correlation test below each correlation coefficient among the variables.

Along with correlation matrix, tests of multicollinearity are performed. First, the Variance Inflation Factor (VIF) test is presented in Table 4.

Table 4. Test VIF

Variable	VIF	SQRT VIF	Tolerance	R-Squared	Eigenvalue	Condition Index
credit_risk	1.22	1.10	0.8199	0.1801	2.0604	1.0000
prof	1.80	1.34	0.5545	0.4455	1.8142	1.0657
pol	1.35	1.16	0.7407	0.2593	1.3054	1.2563
size	1.03	1.02	0.9699	0.0301	1.2146	1.3024
cap	1.91	1.38	0.5229	0.4771	0.9413	1.4795
eff	1.64	1.28	0.6101	0.3899	0.8620	1.5461
liq	1.86	1.36	0.5381	0.4619	0.7192	1.6926
state	1.35	1.16	0.7404	0.2596	0.4299	2.1892
ag	1.31	1.14	0.7645	0.2355	0.3487	2.4309
op_lev	1.25	1.12	0.8022	0.1978	0.3043	2.6021
Mean VIF	1.47				Condition Number	2.6021

In this case, the VIF values vary between (1.03) and (1.91) and the average equals to (1.47).

This implies the absence of the problem of multi-collinearity.

Second, BKW test based on the interrelationships among the independent variables is performed. Table 5 lists Condition Indexes and Variance-Decomposition Proportions. The singular values in the second column of the table are condition indexes.

Table 5. Test BKW

	condition index	credit_risk	prof	pol	size	cap	eff	liq	state	ag	op_lev
1	1.00	0.03	0.06	0.00	0.00	0.07	0.02	0.04	0.00	0.07	0.02
2	1.07	0.00	0.04	0.08	0.00	0.01	0.08	0.05	0.02	0.00	0.07
3	1.26	0.12	0.01	0.00	0.10	0.01	0.04	0.00	0.24	0.04	0.00
4	1.30	0.08	0.02	0.18	0.12	0.02	0.01	0.05	0.10	0.01	0.00
5	1.48	0.01	0.00	0.00	0.29	0.07	0.00	0.05	0.00	0.13	0.28
6	1.55	0.33	0.01	0.07	0.48	0.00	0.01	0.00	0.00	0.02	0.10
7	1.69	0.15	0.07	0.16	0.00	0.00	0.05	0.01	0.02	0.35	0.22
8	2.19	0.02	0.00	0.31	0.00	0.00	0.34	0.00	0.44	0.36	0.18
9	2.43	0.26	0.54	0.20	0.00	0.06	0.43	0.09	0.17	0.01	0.08
10	2.60	0.00	0.25	0.00	0.00	0.75	0.02	0.71	0.00	0.00	0.04

The table lists Condition Indexes and Variance-Decomposition Proportions. The singular values in the second column of the table are condition indexes.

Condition indices presented in Table 5 are lower than, the values are between 1 and 2.6 for all variables. Hence, the issue of multicollinearity does not a challenge for our study.

4.2. Estimation results

Table 6 presents the estimation results of fixed and random effects linear models from using loan loss reserves ratio, a measure of credit risk as the dependent variable (a higher value of loan loss reserves indicates high risk-taking). The calculated Fischer statistic is listed in table 6 below. The p-value of F-statistic is equal to 0.000 and the null hypothesis is rejected, so we have to include individual effects in the model. The p-value of Hausman statistic which is equal to 0.0738 demonstrates that random effects method is more appropriate for our model.

The results from the random effects model show that capital is significant at 1% and negatively related to risk, while operating leverage is positively significant at 1%. That is high level of equity implies more prudent bank behavior and less risk taking. The positive effect of operating leverage on risk is similar to the findings of Lassoued *et al.* (2016) stating that operating leverage as financial leverage increases bank risk. Political connections and state ownership have a positive relation with risk and significant at 10%. As the results of Berger *et al.* (2005) and Srairi (2013) state owned banks have poorer loan quality and higher default risk than private banks. Besides, politically connected banks take more risk than non-connected ones and these consistent with our hypothesis that politically backed banks will tend to exploit the moral hazard which will eventually cause them to take extra risk.

Table 6. Fixed and Random effect model estimation

variable	Fixed effect model			Random effect model		
	Coef.	Std. Err.	t	Coef.	Std. Err.	z
prof	-.405353	.3185953	-1.27	-.5282119	.3237423	-1.63
pol	-	-	-	3.864513*	2.335748	1.65
cap	-.4165295***	.107597	-3.87	-.3239119***	.1019588	-3.18
size	3.24e-07	1.45e-06	0.22	-1.82e-07	1.40e-06	-0.13
eff	.0142634	.020743	0.69	.0072845	.0210764	0.35
liq	.0013295	.0123776	0.11	.0014539	.0110794	0.13
state	-	-	-	6.093916*	3.483949	1.75
ag	-.0314666	.0223544	-1.41	-.0284447	.0228256	-1.25
op_lev	259.8606***	44.69411	5.81	204.8943***	41.09408	4.99
constant	9.50671***	1.889168	5.03	6.853546***	2.488759	2.75
F (31,259)	23.63			-		

Prob>F	0.000	-
Within R²	0.1722	0.1689
Between R²	0.0000	0.0429
Overall R²	0.0144	0.0788
σ_{u_i}	7.9289885	5.7368373
σ_{e_i}	4.2406333	4.2406333
rho	.77758115	.64666022
Hausman chi2(6)	11.51	
Prob>chi2	0.0738	

rho is the intraclass correlation (the fraction of variance due to differences across panels). σ_{e_i} and σ_{u_i} are the standard deviations of residuals (overall error term) and residuals within groups.

*, **, *** Significant at 10%, 5% and 1%.

Then, in order to test the statistical significance of explanatory variables, we proceed to iterative elimination of statistically insignificant coefficient of variables. We restart the regression with one less insignificant variable until we end with 5 significant variables as in shown in (5).

Table 7 presents detailed results from different estimations. Results with respect to the latest estimation are the same to table 6 except for profitability which become significant at 5%. The effect of profitability is negative indicating that more profitable banks are less likely to fail (Psillaki *et al.*, 2010). Capital is negatively related to risk while political connections, state and operating leverage have positive coefficients. This confirms our previous results.

Table 7. Random effect model iterative estimation

Variable	(1)	(2)	(3)	(4)	(5)
prof	-0.52821188	-0.53373524*	-0.53852268*	-0.56679868**	-0.67708273**
pol	3.864513*	3.887071*	3.8705437*	3.8229455	4.0413866*
cap	-0.32391195***	-0.32057942***	-0.31786693***	-0.33365727***	-0.32597058***
size	-1.819e-07				
eff	.00728448	.00714636	.00735885		
liq	.00145386	.00148275			
state	6.093916*	6.1186336*	6.1007887*	6.0488151	6.3957985*
ag	-0.02844472	-0.02820419	-0.02812268	-0.02970809	
op_lev	204.89431***	203.08932***	204.10169***	213.6762***	206.05037***
constant	6.853546***	6.8378568***	6.8973547***	7.3504169***	6.9984583***

(1) estimation of the model including all variables, (2) to (5) estimations with one less insignificant variable

*, **, *** Significant at 10%, 5% and 1%

In addition, an estimation of our model with standardized variables is added to the results of table 7 to remove the effect of the unit of measure. The estimated coefficients are relative to the contribution of corresponding variables on the model. Results are presented in Table 8.

Table 8. Estimation of model (5) with standardized variables

	Coef.	Std. Err.	z	P>z
prof	-.1202492**	.0491125	-2.45	0.014
pol	.2466349*	.1486033	1.66	0.097
cap	-2.2374265***	.0675788	-3.51	0.000
state	.257854*	.146734	1.76	0.079
op_lev	.3875062***	.0740737	5.23	0.000
constant	-.0279698	.1391516	-0.20	0.841
Within R²	0.1639			
Between R²	0.0401			
Overall R²	0.0761			
σ_{u_i}	.75146638			
σ_{e_i}	.51662634			
rho	.67905083			

rho is the intraclass correlation (the fraction of variance due to differences across panels). σ_{e_i} and σ_{u_i} are the standard deviations of residuals (overall error term) and residuals within groups.

*, **, *** Significant at 10%, 5% and 1%

We note that there is a clear dominance of “cap” variable. However, the variable of “pol” is not negligible compared to other variables like state ownership or profitability.

Regarding the analysis of possible nonlinear and indirect effects, we first estimate the second model that includes the quadratic and interactive terms. Table 9 shows the results of fixed and random effect estimations. Based Hausman test, we retain the fixed effects model.

Table 9. Estimations with quadratic and interactive terms

variables	Fixed effect model			Random effect model		
	Coef.	Std. Err.	t	Coef.	Std. Err.	z
prof	-.2951139	.3942481	-0.75	-.3883442	.4098886	-0.95
pol	-	-	-	-.5372411	5.081647	-0.11
pol²	-	-	-	-	-	-
pol×prof	.4563572	.6826894	0.67	.1196103	.6967041	0.17
pol×cap	.3141189	.2327443	1.35	.1820346	.2280544	0.80

pol×size	.0001495	.0001108	1.35	.0001221	.0001033	1.18
pol×ag	.0635351	.044694	1.42	.0593004	.0460974	1.29
pol×eff	-.0543581	.0464896	-1.17	-.0481089	.0472469	-1.02
pol×liq	.0726593*	.0428739	1.69	.036549	.0381113	0.96
pol×state	-	-	-	-	-	-
pol×op_lev	147.1472	99.48451	1.48	53.12976	92.76796	0.57
size	3.64e-07	1.43e-06	0.26	-1.75e-07	1.40e-06	-0.13
cap	-.4998609***	.1281796	-3.90	-.3660765***	.1223878	-2.99
eff	.0592861	.0390702	1.52	.0448261	.039423	1.14
liq	-.0071355	.0128743	-0.55	-.0024089	.0119593	-0.20
state	-	-	-	5.989508*	3.559618	1.68
ag	-.0569295*	.0316444	-1.80	-.0512038	.0326213	-1.57
op_lev	249.0946***	53.21131	4.68	206.5823***	51.50323	4.01
constant	4.794235**	2.341347	2.05	5.741699*	3.417606	1.68
Within R²	0.2305			0.2219		
Between R²	0.0047			0.0202		
Overall R²	0.0176			0.0523		
σ_{u_i}	9.6383889			5.7313149		
σ_{e_i}	4.1449441			4.1449441		
rho	.84392531			.65658473		
Hausman chi2(9)	28.73					
Prob>chi2	0.0007					

rho is the intraclass correlation (the fraction of variance due to differences across panels). σ_{e_i} and σ_{u_i} are the standard deviations of residuals (overall error term) and residuals within groups.

*, **, *** Significant at 10%, 5% and 1%

Accounting for the nonlinear effect, the quadratic term of “pol” is omitted from the estimation results and this may be due to collinearity problem. It is obvious that the variables of “pol” and “pol²” will be highly correlated, however, in this case, it is not necessary to deal the collinearity problem in the model since the second variable is nonlinear function of the first one.

Respecting the other variables added, the coefficients of the interactive terms between political connections and other variables are insignificant except for liquidity which is statistically significant at 10% and positive. The ratio of total loans to total deposits reflects the extent to which customer deposits finance loans. A high ratio indicates high credit risk for banks. In this case, less liquid politically connected banks will be more likely to fail. Operating leverage is also positively significant at 1%. The variables of capital and asset growth are negative and significant at 1% and 10% level respectively. Banks with increasing growth of assets can diversify their risk because they have more future opportunities, variety

of loans and other activities. According to Dohner (1991), growth opportunities may add value and sense of success to firms and attract additional business.

Then we proceed to iterative elimination of statistically insignificant coefficients of the variables to end with 5 significant variables. Detailed estimations of the iterative procedures are presented in table 11a and table 11b (see Appendix). Table 10 presents only the final estimation including 5 significant variables.

**Table 10. Fixed effect model estimation
(including only significant variables)**

credit_risk	Coef.	Std. Err.	t	P>t
pol	-	-	-	-
pol2	-	-	-	-
pol×cap	.5202665**	.2154653	2.41	0.016
pol×ag	.101805**	.0413302	2.46	0.014
pol×state	-	-	-	-
cap	-.6117276***	.1150848	-5.32	0.000
state	-	-	-	-
ag	-.090253***	.0284457	-3.17	0.002
op_lev	280.9567***	43.17389	6.51	0.000
_cons	9.491848***	1.216883	7.80	0.000
Within R²	0.01971			
Between R²	0.0024			
Overall R²	0.0156			
σ_{u_i}	8.6213766			
σ_{e_i}	4.1602025			
rho	.81112887			

rho is the intraclass correlation (the fraction of variance due to differences across panels). σ_{e_i} and σ_{u_i} are the standard deviations of residuals (overall error term) and residuals within groups.

*, **, *** Significant at 10%, 5% and 1%

Capital and asset growth are negatively significant at 1% while operating leverage is positive. These results are also similar to the results provided by previous estimations. The interactive variable between liquidity and political connections is no longer significant. However, the interactive terms relative to capital and asset growth are statistically significant at 5% and positive.

There are a number of difference in the results obtained in the estimation compared to those reported in the previous estimations reported in tables 6,7 and 8. First, the coefficient of profitability is no longer significant. Second, while the coefficients of capital and asset growth

appear to be significant and negative, their corresponding terms interacted with political connections are significant indicating an indirect effect of political patronage on risk through asset growth and capital, and this effect is positive. In other words, politically connected banks with high level of equity and high growth of assets have high level of credit risk.

5. Conclusion

This article examines the impact of political connection on risk taking behavior of banks in MENA region. For this purpose, we employ linear panel data analysis on a sample of 32 MENA banks for the period 2003-2014, in which the impact of political connections along with some control variables on credit risk is assessed in the first step. In the second step, we implement iterative estimations. Generally, we find that politically connected MENA banks take more risk than their non-politically connected counterparts in line with the results of Qian *et al.* (2015) that the special political connections of officials and boards lower the prudential behavior of banks. Regarding the analysis of indirect effects, we interact political connections with other determinants. An interesting result is that while there is no direct effect of political connections on risk, its interaction with asset growth and capital respectively appear to be significant. Hence, there is an indirect and positive effect of political patronage on risk taking behavior. Compared to studies involving the MENA region, mainly Lassoued *et al.* (2016) and Srairi (2013), we find that political connections as substitute for state-ownership has a similar impact on bank risk taking behavior. Yet, we provide evidence of possible indirect impact of political ties which has not been addressed in previous studies. Overall, this study suggests that the association between bank risk and political connections supports the moral hazard-based theory predicting that firms with better political connections should take more risk. Our main result is in line with studies dealing with non-MENA context (Dam and Koetter, 2012; Mariathanan, 2014; Kostovestky, 2015). The idea is that politically backed firms tend to behave less prudently as they believe they would be bailed out by the government.

This research has several implications globally, and for the MENA region in particular because political patronage is common but more pronounced in states with high level of corruption and where politicians and royal families are involved in the board of banks. For banking industry, the politician-bank network should be carefully considered by regulators and market participants. Banks tend to exploit the moral hazard through their connections to maximize their value and engage in less efficient and riskier activities as they expect to be

bailed out by the government in case of distress. Thus, the regulator should monitor these banks and ensure their competitiveness and efficiency.

Appendix

Table 11a. Fixed effect model iterative estimations

Variables	(6)	(7)	(8)	(9)	(10)
prof	-.29511389	-.29606974	-.25690717	-.12050084	
pol	-	-	-	-	-
pol²	-	-	-	-	-
pol×prof	.4563572	.45731305	.41815048		
pol×cap	.31411889	.31549521	.33836621	.37054673*	.36798973*
pol×size	.00014945	.00014981	.00014981	.00015238	.00015129
pol×ag	.06353508	.06436483	.0648502	.06925101	.06996159
pol×eff	-.05435806	-.05319879	-.05296289	-.06384937	-.0668709
pol×liq	.07265934*	.07263653*	.0655238	.05905698	.06182282
pol×state	-	-	-	-	-
pol×op_lev	147.14717	146.90143	139.85467	144.30177	145.59961
size	3.641e-07				
cap	-.49986092***	-.50123724***	-.52410824***	-.53265568***	-.54020645***
eff	.05928609	.05812683	.05789092	.06374683*	.06891991**
liq	-.00713554	-.00711273			
ag	-.05692953*	-.05775928*	-.05824465*	-.06022223*	-.06196921**
state	-	-	-	-	-
op_lev	249.09463***	249.34037***	256.38713***	253.94654***	251.79052***
constant	4.7942347**	4.8547693**	4.6117783**	4.7647108**	4.4913154**
Aic⁽¹⁾	1673.1694	1671.2466	1669.6072	1668.0547	1666.2236
Bic⁽²⁾	1728.6258	1723.0059	1717.6694	1712.4198	1706.8916

(6) estimation including all variables, (7) to (10) estimations with one less insignificant variable

*, **, *** Significant at 10%, 5% and 1%,

(1) Akaike Information Criteria. (2) Bayesian Information Criteria.

Table 11b. Fixed effect model iterative estimations

Variables	(11)	(12)	(13)	(14)	(15)
prof					
pol	-	-	-	-	-
pol²	-	-	-	-	-
pol×prof					
pol×cap	.3822666*	.39604156*	.44675933**	.4448842**	.52026653**
pol×size	.000118				
pol×ag	.07974917*	.07311648*	.08962944**	.09656746**	.10180499**
pol×eff	-.06247165	-.06392907			
pol×liq	.06141748	.06323066	.06817441*	.06152438	
pol×state	-	-	-	-	-
pol×op_lev					
cap	-.56051077***	-.55741089***	-.59018279***	-.6127698***	-.61172761***
size					
eff	.07028512**	.07007669**	.02518237		
liq					
ag	-.06752958**	-.06668067**	-.08121134***	-.0905467***	-.09025303***
state	-	-	-	-	-
op_lev	291.23619***	285.21398***	278.75369***	282.87704***	280.95669***
constant	4.8654207**	5.2872745**	6.4529915***	8.1876968***	9.4918476***
Aic⁽¹⁾	1666.7959	1666.1788	1666.8765	1666.884	1667.8166
Bic⁽²⁾	1703.7668	1699.4527	1696.4533	1692.7636	1689.9992

(11) to (15) estimations with one less insignificant variable

*, **, *** Significant at 10%, 5% and 1%

(1) Akaike Information Criteria. (2) Bayesian Information Criteria.

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