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Ownership structure and risk-taking behaviour in conventional and Islamic banks: Evidence for MENA countries

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Abstract

This paper investigates the impact of ownership structure, measured by two dimensions: nature of owners and ownership concentration, on bank risk, controlling for country and bank specific traits and other bank regulations. Particularly, it compares risk-taking behaviour of conventional and Islamic banks in 10 MENA countries under three types of bank ownership (family-owned, company-owned and state-owned banks) over the period 2005–2009. The result shows a negative association between ownership concentration and risk. We also find that different categories of shareholders have different risk attitudes. Family-owned banks have incentives to take less risk. State-owned banks display higher risk and have significantly greater proportions of non-performing loans than other banks. By comparing conventional and Islamic banks, the empirical findings show that private Islamic banks are as stable as private conventional banks. However, Islamic banks have a lower exposure to credit risk than conventional banks.
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1. Introduction

Islamic banking has grown rapidly and it is considered as one of the fastest growing segments of global financial industry (Hasan & Dridi, 2010). According to Ernst and young's report 2011, Islamic finance assets around the world are expected to rise by 33% from their 2010 level to $1.1 trillion by the end of 2012, boosted by the aftermath of the Arab spring uprisings and dissatisfaction with conventional finance in the world in the wake of the global debt crisis.

In the Middle East and North Africa (MENA) countries, the growth of Islamic banking also indicates an impressive growth trend. In 2010, the total assets were $416 billion and are expected to rise to $990 billion by 2015 as new countries (e.g., Tunisia, Egypt) open up to Islamic finance. The Islamic banking sector in this region is expected to grow over the next five years at an annual rate of 20%, compared to less than 9% for conventional banks. However, the sector remains fragmented (Islamic banks hold less than $13 billion in assets, while conventional banks hold $38 billion in assets on average) and a lack of benign legislative, regulatory and tax environment among the organization of the Islamic conference countries will continue to pose barriers for the sector by increasing costs for Islamic financial institutions.

Throughout the recent global financial crisis, the Islamic banking sector in the MENA region has demonstrated resilience compared to conventional banks (Boumediene & Caby, 2009; Hasan & Dridi, 2010). According to Syed Ali (2011), three factors helped Islamic banks to remain stable during the

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early phase of the crisis: (i) the financing activities of Islamic banks are more tied to real economic activities than their conventional counterparts, (ii) Islamic banks avoided direct exposure to exotic and toxic financial derivative products and (iii) Islamic banks have kept a large proportion of their assets in liquid form compared with conventional banks.

During the last decade, most studies on Islamic banking have focussed on issues related to the comparison between the performance and instruments used in Islamic and conventional banks (Olson & Zoubi, 2008; Srairi, 2009). Other studies have discussed the regulatory and supervisory challenges of Islamic banking. The analysis of the behaviour of Islamic banks in the perspective of financial stability becomes more important at least for two reasons (Solé, 2007): (i) Islamic banks may become systemically relevant as they grow and increasingly interact with conventional banks that are systematically important, (ii) the lack of Islamic instruments for hedging results in the concentration risks in a small number of institutions. In addition, the implementation of Islamic institutions in many countries did not come from the government but from individuals or small groups. Islamic banks tended to become closely owned entities. According to Syed Ali (2006, 2007), this situation opens Islamic banks to risks emanating from lack of sound corporate governance and contributes to financial distress. Despite the importance of these issues, a few empirical papers (e.g. Cihak & Hesse, 2008; Gamaginta & Rokhim, 2011; Hasan & Dridi, 2010; Sayd, Kabir, & Gregory, in press) have analysed the question of risk and stability in Islamic banks and whether and how these aspects differ from conventional banks. None of these studies investigates the determinants of bank risk-taking or compares the stability of the two types of banks under a specific ownership structure. To fill this gap in the empirical literature on the stability of Islamic banking, we attempt in the first part of this paper to carry out an empirical study of the effect of ownership structure on the risk of commercial banks, controlling for country and bank characteristics and other bank regulations such as insurance deposit and shareholder rights. In addition, our second objective is to analyse the link between ownership structure and risk for both conventional and Islamic banks. Specifically, we try to answer two questions. First, we investigate the determinants of risk-taking in the Middle East and North Africa (MENA) banking industry during the 2005–2009 period, with special emphasis on both dimensions of ownership structure, namely (nature of the owners and ownership structure). Second, we compare and assess the risk-taking behaviour of conventional and Islamic banks under specific ownership profiles concerning family-owned, company-owned and state-owned banks.

Our empirical analysis extends the existing literature in three main directions. First, to our knowledge, this is the first study that analyses the risk-taking behaviour of conventional and Islamic banks under three types of bank ownership. Second, our model comprises two measures of risk, two measures of ownership structure and several variables relative to country and bank specific traits. Third, our sample comprises more than 90% of MENA Islamic and conventional banks, which makes it the most comprehensive database on commercial banks in this region.

The remainder of the paper is organized as follows. Section 2 is a review of the literature related to the determinants of bank risk-taking and the comparison of the level of stability between conventional and Islamic banks. Section 3 describes the data, variables and descriptive statistics. Section 4 presents the methodology and the risk-taking model. Section 5 discusses the empirical results. Section 5 provides robustness checks, and the paper ends with concluding remarks in Section 7.

2. Review of literature

Our aim in this section is to survey key studies related to the factors influencing bank risk taking and to the differences in stability between conventional and Islamic banks.

2.1. Studies on determinants of bank risk taking

A review of the theoretical and empirical literature reveals numerous attempts to analyse the determinants of bank risk taking. According to agency theory, risk taking behaviour is influenced by conflicts between managers and shareholders (Jensen & Meckling, 1976). Theory predicts that managers are risk-averse to protect their position and personal benefits whereas shareholders with a diversified portfolio have incentives to increase bank risk after collecting funds bondholders and depositors (Esty, 1998; Galai & Masulis, 1976). However, the agency problem may be mitigated in firms with concentrated ownership structure, as controlling shareholders have strong incentives to monitor managers, and even replace them in the case of poor performance (Franks, Mayer, & Renneboog, 2001). Thus risk-taking is expected to be more pronounced in firms with concentrated ownership than in firms with dispersed ownership structure. Empirically, the relationship between ownership concentration and risk is ambiguous. Several studies (e.g. Haw, Ho, Hu, & Wu, 2010; Laeven & Levine, 2009) showed that concentrated ownership control is associated with greater risk. In contrast, Shehzad, De Haan, and Scholtens (2010) find that if ownership concentration increases, the credit risk decreases. The type of shareholders could also represent a source of risk in firms. Family companies, for example, may also avoid risk taking because their objective is to transfer a firm to the next generation (Anderson, Mansi, & Reeb, 2003). However, other researchers (e.g. Laeven, 1999; Anderson et al., 2003) found that family firms are significantly less diversified, and therefore riskier, than non-family firms. In addition to the difference between family and non-family owned firms, other aspects have been well established in the literature concerning state-owned and privately-owned firms. Iannotta, Nocera, and Sironi (2007), compare performance and risk in a sample of 181 banks from 15 European countries. They find that state-owned banks have poorer loan quality and higher insolvency risk than private and mutual banks while mutual banks have better loan quality and lower asset risk than both private and public sector banks.

Other studies compare foreign-owned banks with other types of banks. Laeven (1999), investigated a panel of Asian banks and found that foreign-owned banks take more risk than state-owned, company-owned and family-owned banks. Among other factors that are likely to influence the risk taking behaviours of firms is the legal environment and bank regulations. Several studies (e.g. Gonzalez, 2005; Laeven & Levine, 2009; La Porta, Florencio, Andrei, & Robert, 1998) found that deposit insurance, activity restrictions, capital regulation and shareholders' protection affect the ability of bank owners to take risk. For example, deposit insurance intensifies the ability and incentives of stockholders to increase risk (Keeley, 1990; Merton, 1977). Strong investor protection is positively related to risk taking (John, Litov, & yeung, 2008; Paligorava, 2010). Capital regulations reduce the risk-taking incentives of owners by forcing owners to place more of their personal wealth at risk in a bank (Kim & Santomero, 1994; Laeven & Levine, 2009). Better protected creditors cause shareholders to incur higher bankruptcy costs, which motivates the latter to avoid insolvency by engaging in conservative investment policies (Acharya, Amihud, & Litov, 2008). Nier and Baumann (2006), among others, suggest that greater disclosure and transparency strengthen market discipline and reduce risk taking of banks. Finally, incentives to risk taking are also influenced by the characteristics of banks (Caprio, Laeven, & Levine, 2007; Paligorova, 2010) and economic conditions (La Porta et al., 1998; La Porta, Florencio, Andrei, & Robert, 2002).

2.2. Stability of conventional and Islamic banks

The recent global crisis has shed light again on the importance of examining the relationship between Islamic banking and financial stability and whether Islamic banks fared differently compared to conventional banks during the crisis. In this section we present three recent studies that attempt to address this question.

The study of Cihak and Hesse (2008) is considered the first study to analyse the role of Islamic banks in financial stability. Using *Z*-score as an indicator of insolvency risk, this paper compares stability between conventional and Islamic banks in 18 countries over the period 1993–2004. This study has yielded three main results: (i) small Islamic banks tend to be more stable than small conventional banks, (ii) large conventional banks tend to be financially stronger than large Islamic banks, and (iii) large Islamic banks are more risky than small Islamic banks. Another study was conducted by Hasan and Dridi (2010) to analyse and compare the impact of the recent crisis on conventional and Islamic banks in terms of profitability, credit and asset growth and external ratings. The sample comprises 120 banks in 8 countries during the 2007–2010 period. The results show that the initial impact of the crisis in 2008 on the profitability of Islamic banks was limited. However, between 2008 and 2009, Islamic banks in some countries fared relatively worse than conventional banks. In terms of credit and asset growth, the authors found that these indicators are at least twice higher in Islamic banks than that in conventional banks during the crisis. The assessment of Islamic banks' risk by external rating agencies was generally more favourable or similar to that of conventional banks. Recently, Gamaginta and Rokhim (2011) analysed the stability of 12 Islamic banks and 71 conventional banks in Indonesia using the *Z*-score indicator during the period 2004–2009. The empirical results indicate that the stability of Islamic banks is generally lower than that of conventional banks except during the crisis period of 2008–2009 where the two categories of banks tended to have the same relative degree of stability. They also found that small Islamic banks have the same level of stability as small conventional banks.

In view of these studies, we notice that there are different findings concerning the stability of conventional and Islamic banks especially in periods of crises. In this study, we attempt to examine this question by analysing the influence of ownership structure on the stability of banks in MENA countries.

3. Data and variables

3.1. Sample data

The original dataset includes 175 banks in MENA region. We have applied an outlier rule to the main variables which allows to drop the banks for which data on some variables are either not available or contain extreme values for certain indicators. In addition, we have chosen banks by applying some selection criteria. First, to create a balanced panel, we only kept banks with a minimum of five consecutive years. Similarly to Barry, Lepetit, and Tarazi (2011), we also delete banks whose ownership shares of the main categories of shareholders fluctuate by more than 10% over the sample period. Thus, we obtain banks with a stable ownership structure and consequently we can accurately analyse the impact of different ownership categories on the risk of banks. Finally, in order to have a homogenous sample, we only retain commercial banks and do not consider other types of banks (e.g., investment, cooperative). The final sample comprises 131 commercial banks (93 conventional and 40 Islamic banks) operating in ten MENA countries (Bahrain, Egypt, Jordan, Kuwait, Qatar, Saudi Arabia, Sudan, Turkey, Yemen and the United Arab Emirates) over the period 2005–2009 (see Table 1). The annual financial data and the ownership information of banks are obtained from the Bankscope Database of Van Dijk's Company Bureau. The macroeconomic, financial industry and interest rate variables are sourced from International Financial Statistics (IFS) and from annual reports published by central banks in each MENA country.

3.2. Risk variables

Several different measures of asset risk and default risk have been used in the literature. In this paper, we proxy bank's risk by using two measures: the ratio of non-performing loans to total loans (NPLOAN) and the *Z*-score (Table 2) developed by Boyd and Graham (1986, 1988). First, following Barth, Caprio, and Levine (2004) and Gonzalez (2005), we use

Table 1
Number of banks by country, type of bank and nature of owners.

Country	Conventional banks				Islamic banks				Total
	Company	Family	State	Total	Company	Family	State	Total	
Bahrain	4	1	2	7	9	2	1	12	19
Egypt	16	–	2	18	1	–	–	1	19
Jordan	6	4	–	10	2	–	–	2	12
Kuwait	3	1	1	5	4	–	–	4	9
Qatar	2	1	3	6	1	–	–	1	7
Saudi Arabia	8	–	1	9	2	–	–	2	11
Sudan	7	2	4	13	5	1	–	6	19
Turkey	1	2	1	4	2	1	–	3	7
Yemen	3	–	–	3	2	3	–	5	8
United A. Emirate	14	1	1	16	4	–	–	4	20
Total	64	12	15	91	32	7	1	40	131

(NPLOAN) as a direct ex-post mean of credit risk. Since a portion of non-performing loans will result in losses for the bank, a high value for this ratio is associated with higher credit risk (Delis & Kouretas, 2011). The second ratio, *Z*-score as proxy for distance to default, is equal to the mean of return on assets plus the capital asset ratio (equity capital/total assets) divided by the standard deviation of asset returns computed over a 3 moving window of 3 year. It is referred to as a measure of bank stability since it represents the inverse of the probability of insolvency of a bank (Laeven & Levine, 2009). Thus, a higher value of *Z*-score is interpreted as a decrease in risk and indicates that the bank is more stable. On the other hand, the *Z*-score can be decomposed into two parts and incorporate two types of risk (Lepetit, Nys, Rous, & Tarazi, 2008). The first part is considered as a measure of bank portfolio risk (ROA/SDROA) and the second is a measure of leverage risk (capital asset ratio/SDROA). According to Garcia-Marco and Roles-Fernandez (2008), *Z*-score considers risk of failure to be essentially dependant on the interaction of the income generating capacity, the potential size of return shocks, and the level of capital reserves available to absorb sudden shocks. For each measure of risk, we develop a specific model.

Table 2
Variables' description.

Variables	Definition and measure
Dependent variables	
Credit-risk	Ratio of non-performing loans to total loans
Z-score	Indicator of insolvency risk, measured as the mean of return on assets plus the capital asset ratio (equity capital/total assets) divided by the standard deviation of asset returns.
Independent variables	
Ownership variables	
Ownership concentration	Equity percentage participation by the largest shareholder of the bank.
Family	Proportion of equity held by individual or family investors.
Company	Proportion of equity held by financial and non-financial company.
State	Proportion of equity detained by the government.
Bank-specific variables	
Size	Natural logarithm of total assets.
Efficiency	Cost to income ratio.
Operating leverage	Fixed assets to total assets.
ROA: return on asset	Net income to total assets.
Diversification	Non-interest income to total operating income.
Asset growth	(Assett − Assett-1)/Assett-1.
Loan growth	(Loant − Loant-1)/Loant-1.
Leverage ratio	Equity to total assets.
Financial and Economic indicators	
Level of economic development	Per capita GDP.
Inflation	Annual average rate of inflation
Deposit insurance system	1: if there is an explicit system of insurance, 0: if the implicit system is adopted.
Shareholders rights	Minimum of percentage of ownership share that entitles a shareholder to call for an extraordinary shareholders' meeting. 1 if the minimum percentage is less than 10% and 0 otherwise.
Banking sector development	Credit to private sector/GDP.
Bank concentration	Assets of 3 largest banks to total assets of all banks in the country.
Interest rate	Three months interbank rate.

It is interesting to note that there is an alternative measure of bank risk based on market and not on accounting data (e.g., volatility of equity returns, market return). These measures can identify the specific risk of each bank and the risk related to the market; however, in this study we do not use the indicators since a few banks in our sample are listed in the stock exchange market.

3.3. Ownership variables

We measure ownership structure by two main dimensions: ownership concentration and the nature of the owners (Table 2). The first variable (CONC) is measured by the equity percentage participation by the largest shareholder of the bank. It represents the sum of direct and indirect fraction of the bank's voting right held by the largest shareholder from the Bankscope database. Concerning the impact of ownership concentration on risk taking, there is no consensus in the literature on the sign of the relationship. Some studies find a positive association (Martinez & Ramirez, 2011; Saunders, Strock, & Travlos, 1990), whereas others (Burkart, Gromb, & Panunzi, 1997; Iannotta et al., 2007) find a negative impact on bank risk. However, other researchers (Anderson & Fraser, 2000;

Gorton & Rosen, 1995) conclude that ownership concentration has a non-linear (U or inverse U) relationship with risk. Besides the concentration variable, we choose three categories of owners for which we can obtain information and whose nature, behaviour and incentives to take risk we are able to identify. These categories of owners in our study concern: individual/family investors (FAMILY), financial and non-financial company (COMPANY), and publicly owned banks (STATE). Thus, following Barry et al. (2011), we create three continuous variables instead of dummy variables that report the proportion of equity held by each category of owner for each bank in our sample.

3.4. Control variables

Our two models include a number of bank characteristics and country-level variables that are considered to affect either the bank's risk taking or the measurement of that risk (Table 2). At the bank level, following prior studies (Cihak & Hesse, 2008) four variables are included for each model to control for bank size, efficiency, profitability and operating leverage. SIZE is measured as the natural logarithm of the bank's total assets. We use log transformation to allow for a possible non-linear relation with risk. Large banks have the ability to diversify risk across product lines and are more skilled in risk management than small ones (Garcia-Marco & Roles-Fernandez, 2008; Nguyen, 2011). We expect that bank size and risk should be negatively related. Bank efficiency (EFEC) is proxied by cost to income ratio. Banks with lower managerial efficiency have higher risk. Using a data of 272 commercial banks operating in Latin American region, Kasman and Carvallo (2013) find that in the face of increased risk and a lowered capital, banks have tended to improve cost-efficiency. ROA is the ratio of net income to total assets. The impact of this variable on bank risk-taking is ambiguous (Delis & Kouretas, 2011). However, in our study, we expect a positive association between risk and profitability, because high profit is generally accompanied by higher levels of risk. We also control for the effect of operating leverage on bank risk by using the ratio of fixed assets to total assets (LEVOP). This ratio is expected to be positively related to bank risk. Controlling for these variables is important because there are many differences in these indicators between Islamic and conventional banks (Hasan & Dridi, 2010; Srairi, 2009, 2010). For insolvency risk model, we add two others variables, business model and asset growth. The first variable (BUSIN) is represented by share of non-interest income in total operating income. Some of studies (Abedifar, Tarazi, & Molyneux, 2013; Lepetit, Nys, Rous, & Tarazi, 2008; Stiroh, 2004, 2006) conclude that banks with high non-interest income share have higher relative insolvency risk. However, other studies (e.g., Litan, 1985; Wall & Eisenbeis, 1984) provided suggestive evidence that banks could reduce their riskiness by diversifying into no bank activities. Asset growth (AGROW) is also included in the model for insolvency risk to control for the growth strategy of banks (Abedifar et al., 2013). Concerning the credit risk model, we control for two others variables, loan growth (LGROW) and leverage ratio (LEVER). We expect a positive relationship between risk and loan growth, such that the increase in credit may be reflective of weakening screening standards and therefore higher risk (Abedifar et al., 2013). Leverage ratio is proxied by equity to total assets. According to banking literature, total equity is considered to provide buffer against loss; hence increasing this variable can reduce credit risk (Rahman, Ibrahim, & Meera, 2009). In the case of Chinese listed firms, Huang, Wu, and Liao (2013) find a positive relationship between risk and leverage ratio.

At the country level for the two models, we control for the level of economic development, banking development, competition in the banking system, protection of depositors and shareholders' rights. Gross domestic product (GDP) is a measure of a country's economic development, represented by annual GDP per capita (in terms of US dollars). According to La Porta et al. (2002), this variable also captures a country's

Table 3
Descriptive statistics of dataset by type of banks (average values).

Variables	Full sample		Conventional banks		Islamic banks		Difference in mean
	Mean	SD	Mean	SD	Mean	SD	
Panel A: Risk measures							
Z-score	24.41	21.59	21.7	19.82	20.82	23.66	2.54
Non-performing loan/total loans	7.44	10.65	9.93	11.05	6.46	10.65	3.46*
Panel B: Ownership variables							
Concentration	51.88	29.87	48.96	31.21	44.19	30.15	4.82
Family	11.64	21.01	8.89	15.54	13.92	22.9	−5.03*
Company	54.47	36.52	59.94	35.7	45.94	34.95	14.00*
State	14.09	27.74	17.74	28.93	0.53	3.44	17.21*
Panel C: Bank level control variables							
Size (US $ million)	5833	8321	7240	10,370	4177	7927	30.63*
Cost to income	53.31	145.61	47.33	33.21	55.08	71.04	−7.74***
ROA	3.28	8.01	1.32	2.03	5.11	13.03	−3.78**
Fixed asset	1.6	1.69	1.16	0.77	2.3	2.5	−1.14
Equity to assets	20.1	17.94	15.1	9.8	28.5	23.9	4.07*
Non-interest income to total operating income	22.48	15.57	22.7	11.89	23	20	1.36

All variables are in percentage, except where indicated. *, **, *** significantly different from zero at 1%, 5% and 10% levels, respectively using a two-tailed tests.

general institutional quality. Poorer countries generally have weaker governance structure. Countries with higher level of GDP per capita have lower risk. Inflation (INF) is measured by the growth of the consumer price index and is expected to have a positive effect on bank risk. Banking sector development is proxied by credit to private sector divided by GDP (CPGDP). This ratio is expected to influence, like the GDP variable, bank risk negatively. Bank concentration as proxy for competition in the banking system (BCONC) is represented by the assets of the three largest banks to the assets of all commercial banks in the country concerned (Beck et al., 2006). According to Sullivan and Spong (2007), banks in concentrated market with higher franchise values have fewer incentives to take on greater risk and thereby exploit the moral hazard features of deposit insurance. We therefore expect a negative association between market concentration and risk. Deposit insurance (DEPINS) is a dummy variable indicating if the country has explicit deposit insurance or not (yes = 1; no = 0). Deposit insurance can limit the risk of bank runs. Many studies (e.g., Gropp & Vesala, 2001) find that an explicit deposit insurance system is associated with a decline in banks' risk taking incentives. However, insured deposit can create a moral hazard problem caused by limited liability of bank's shareholders and the reduced incentives of insured depositors to evaluate the riskiness of the banks they provide with funds (Angkinand & Wihlborg, 2007). Thus, bank managers may be encouraged to take more risk in search for higher profits, because the insurance will cover a large part of the bank's debts in case of default. This relation between risk and deposit insurance is more complicated and depends on several factors such as market structure and competition (Keeley, 1990), capital regulations (Besanko & Kanatas, 1996), or bankruptcy costs (Hwang, Shie, Wang, & Lin, 2009). We also control for shareholders' rights (SHRE). It is a measure of shareholders' legal protection of the country. The majority of studies use the index of the statutory rights of shareholders proposed by La Porta et al. (1998) which includes six components[1] and ranges from zero to six. A high value of this index reflects a high protection of minority shareholder against managers or dominant shareholder. Because of lack of information, we proxy the shareholder rights in the study by only one component of the indicator of La Porta et al. (1998). We use a dummy variable concerning the minimum of percentage of ownership share that entitles a shareholder to call for an extraordinary shareholders' meeting. This variable equals 1 if the minimum percentage is less than 10% and 0 otherwise. The banking theory suggests that effective legal protection of shareholders serves as a substitute for the existence of a large shareholder that monitors management (Magalhaes, Gutierrez, & Tribo, 2008). Consequently, countries with high shareholders protection increase bank risk-taking. Finally, we include only in the credit risk model interest rate[2] (IRAT) as a short-term rate measured as the annual average of the three months interbank rate. Delis and Kouretas (2011) show that lower interest rate increase bank risk-taking. They explain this result by the fact that the reduction in interest rate may cause reduced volatility and lower interest rate margins. This situation puts pressure on bank to search for yield in more risky project.

3.5. Summary statistics

Table 3 presents sample descriptive statistics of risk measures, ownership variables and other bank-specific variables for the overall sample and for conventional and Islamic banks. It also reports differences in means for these variables between conventional and Islamic banks.[3] In terms of insolvency risk (*Z*-score), Table 3 (panel A) shows that Islamic banks are as stable as conventional banks. On the contrary Cihak and Hesse (2008) found that Islamic banks tend to be more stable than conventional banks. However, these authors show that there are differences between banks according to their size. Small Islamic banks are more stable than small conventional banks, while large Islamic banks are less stable than large conventional banks. In terms of credit risk, Table 3 (panel A) shows that Islamic banks have a lower level than conventional banks. This result corroborates the finding in Abedifar et al. (2013) and suggests that non-performing loans are lower in Islamic banks than in conventional banks. Concerning the two ownership variables, Table 3 (panel B) indicates that ownership concentration (52%) in the MENA region appears to be higher compared to other countries (e.g. 25% in USA (Demsetz & Lehn, 1985)). There is no significant difference relative to this variable between conventional and Islamic banks. In terms of the nature of owners, figures in Table 3 (panel B) provide sufficient evidence that most banks are controlled by companies. By comparing conventional banks vs. Islamic banks, we see that all categories of shareholders expect family type, exhibit, on average, a significantly higher percentage of equity in conventional banks than in Islamic banks. Statistics further show that the proportion of equity of state category is very low (0.5%) in Islamic banks. Turning to the descriptive statistics of other bank-specific variables, we can then observe that conventional banks differ from Islamic banks in terms of size, efficiency and profitability. Indeed, Table 3 (panel C) shows that compared with conventional

[1] These components are: the country allows shareholders to mail proxy votes, shareholders are not required to deposit shares prior to the general shareholders' meeting, cumulative voting or proportional representation of minorities on the board of directors is allowed, an oppressed minorities mechanism exists, the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equal to 10% and shareholders have preemptive rights that can be waived only by a shareholders' meeting.

[2] Note that related studies proxy interest rate using a number of others measures such as the long-term rate and central bank rate. These variables are missed in our database.

[3] We perform *t*-test for difference in means of the various measures between conventional and Islamic banks. Because the variables may not follow normal distribution, we also use a non-parametric Wilcoxon rank sum test to examine if the two samples are from population with the same distribution. The last test shows a same results as *t*-test.

banks, Islamic banks tend to be significantly smaller, more profitable and are less cost efficient. This result is in line with several studies (Kabir Hassan, 2005; Kamaruddin, Safa, & Mohd, 2008; Srairi, 2010). In terms of operating leverage, we do not find any significant difference between conventional and Islamic banks. To sum up, we can conclude that there are many differences between conventional and Islamic banks relative to risk, type of owners, size, efficiency and profitability.

4. Methodology

To examine whether the risk-taking incentives of banks vary systematically across different bank ownership structure, we estimate the two following pooled regression models:

Model 1 for credit risk

$$\begin{aligned}\mathrm{NLOAN}_{it} = \alpha &+ \beta 1(\text{Ownership structure})_{it} \\ &+ \beta 2(\text{Bank-level control1})_{it} \\ &+ \beta 3(\text{country-level control1})_{jt} \\ &+ \beta 4(\text{type of bank})_{jt} + \beta 5\mathrm{Year}_t \\ &+ \beta 6\mathrm{Country}_j + \varepsilon_{it}\end{aligned} \tag{1}$$

Model 2 for insolvency risk

$$\begin{aligned}Z\text{−score}_{it} = \alpha &+ \beta 1(\text{Ownership structure})_{it} \\ &+ \beta 2(\text{Bank-level control2})_{it} \\ &+ \beta 3(\text{country-level control2})_{jt} \\ &+ \beta 4(\text{type of bank})_{jt} + \beta 5\mathrm{Year}_t \\ &+ \beta 6\mathrm{Country}_j + \varepsilon_{it}\end{aligned} \tag{2}$$

In these models, we regress an ownership structure variable on risk proxies in the presence of the control variables. Where subscripts i denotes commercial banks (i = 1,2…133), t time period (t = 2005,2006,…,2009), j country (10 countries in MENA region), $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$ and $\beta 6$ are the parameters to be estimated and ε_{it} is the error term. The dependent variable, risk, is proxied by the ratio of non-performing loans to total loans (NLOAN) or Z-score. Ownership structure is measured by two variables: ownership concentration (CONC) and the nature of the owners (FAMILY, COMPANY, and STATE). Bank-level control1$_{it}$ for credit risk model is a vector representing i's size (SIZE), efficiency (EFF), profitability (ROA) operating leverage (OPELEV), loan growth (LGROW) and leverage ratio (LEVER) at time t. Bank-level control2$_{it}$ for insolvency risk model contains six variables: size, efficiency, profitability, operating leverage, asset growth (AGROW) and Diversification (DIVER). Country-level control includes for two models economic development (GDP), inflation (INF), banking sector development (CPGDP), competition in the banking system (MARP), deposit insurance (DEPINS) and shareholders' rights (SHRI). For credit risk model, we add interest rate (IRAT). To analyse the differences in risk-taking behaviour between the two types of banks, conventional and Islamic banks, we add to the two models a dummy variable, type of bank (TBANK), which takes a value of 1 for Islamic banks and 0 otherwise. Year and country dummies variables are also introduced in the two models to control for cross-country and time variation. In order to check how different is the ownership and risk-taking relationship for Islamic banks versus conventional banks, we estimate a second model for each measure of risk in which interactions between ownership proxies (mix and concentration) and type of banks.

The methodology chosen to derive the results in this study is based on panel data analysis. Since our models contain many variables like GDP, inflation, bank concentration, deposit insurance, shareholder protection right and interest rate which are the same for all banks in a country, we adopt a country random effects (Shehzad et al., 2010: Wooldridge, 2002). Further, other important variables like ownership concentration and nature of the owners do not vary much over time. In consequence, the use of a fixed effect model is not feasible in this study.[4]

5. Empirical results and analysis

Table 4 reports regression results for the two measures of risk (credit risk and Z-score). Model A concerns regression without interactions between explanatory variables and model B with interactions between ownership proxies and type of banks.

5.1. Ownership concentration and risk-taking

Concerning the impact of ownership concentration on risk-taking behaviour; Table 1 shows a negative and significant association between ownership concentration and risk in all two models. The negative effect suggests that banks with concentrated ownership are taking lower risk in terms of credit risk and insolvency risk than banks in diffuse ownership. This result is in line with the findings of Iannotta et al. (2007) and Garcia-Marco and Roles-Fernandez (2008) and contrary to the agency theory (Jensen & Meckling, 1976) and the results of several studies (e.g., Saunders et al., 1990) which show that large owners lessen the conflicts of interests between managers and shareholders and have greater incentives and power to increase bank risk-taking than small shareholders. Our results are consistent with the argument of Burkart et al. (1997) which states that as the monitoring effort exerted by a large shareholder increases, managerial initiative to pursue new investment opportunities decreases. This can be translated in terms of less risk taking by managers in the case of concentrated ownership structure. In addition, some studies point out (Caprio et al., 2007; Shehzad et al., 2010) that in countries with low level of share-holder protections rights and supervisory control (the case of most MENA countries), ownership concentration reduces bank riskiness. Model B for the two

[4] The Hausman test also suggests the use of the random effects over fixed effects models.

Table 4
Estimation results of base model.

Explanatory variables	Credit risk				*Z*-score			
	Model A		Model B		Model A		Model B	
	Coef.	t-statist.	Coef.	t-statist.	Coef.	t-statist.	Coef.	t-statist.
Ownership variables								
Concentration	−0.198	(−2.81)*	−0.462	(−2.51)**	0.531	(3.15)*	0.721	(2.67)**
Family	−0.431	(−2.25)*	−0.684	(−2.67)**	0.762	(3.42)*	0.641	(3.15)**
Company	0.145	−1.32	0.482	−1.97	0.12	−1.41	0.612	−1.59
State	0.38	(2.35)*	0.468	(2.52)**	0.075	−1.12	0.161	−1.11
Bank-characteristics								
Size	−0.632	(−2.82)*	−0.895	(−3.05)*	1.056	(3.25)*	0.986	(3.02)*
Efficiency	0.007	−0.46	0.096	−1.2	−0.278	(−2.31)*	−0.432	(−2.56)**
Profitability	−0.625	(−3.07)*	−0.593	(−2.96)*	−0.053	(−1.20)	−0.143	(−1.67)
Operating leverage	0.157	−0.93	0.098	−1.24	1.678	(2.51)**	0.946	(2.62)**
Loan growth	0.162	−0.956	0.231	−1.12				
Leverage ratio	−0.314	(−2.41)**	−0.623	(−1.99)**				
Diversification					0.412	(2.14)**	0.314	(2.43)**
Asset growth					0.063	−0.912	0.123	−1.236
Financial and economic variables								
Per capita GDP	−0.124	(−3.56)*	−0.326	(−3.28)*	0.072	−0.98	0.134	−1.23
Inflation	−0.089	(−1.78)*	−0.142	(−1.81)	0.231	−1.25	0.214	−0.94
Insurance deposit	−0.643	(−1.89)	−0.713	(−1.26)	0.094	−0.87	0.123	−1.46
Shareholders rights	−0.568	(−2.97)*	−0.469	(−2.82)*	0.462	(3.125)*	0.765	(2.98)*
Banking sector development	−0.296	(−3.14)*	−0.711	(−3.14)*	0.964	(2.91)*	0.862	(3.04)*
Bank concentration	−0.146	(−1.23)	−0.073	(−0.91)	0.821	(2.98)*	0.765	(2.56)*
Interest rate	−0.231	(−1.41)	−0.093	(−1.05)				
Type of banks	0.231	(2.56)**	0.422	(2.15)***	0.013	−1.05	0.012	−1.32
Year dummy	Yes		Yes		Yes		Yes	
Country dummy	Yes		Yes		Yes		Yes	
Type of banks × concentration			0.231	−1.246			0.412	−1.65
Type of banks × family			0.466	(2.56)**			0.124	−1.04
Type of banks × company			0.126	(2.01)***			0.04	−0.98
Type of banks × state			0.041	−0.87		(2.51)**	−0.31	−1.12
Constant	0.956	(2.06)**	1.235	(1.98)**	0.589		0.851	(2.21)**
Number of observation	655		655		655		655	
R-squared	0.342		0.456		0.395		0.412	
Walid chi-squared	72.23*		74.56*		56.12*		53.2*	

Notes: *t*-statistics are between parentheses. *, ** and *** indicate statistical significance at 1%, 5% and 10%, respectively. The year dummies and country dummies are included in the regressions but their coefficients are not reported in the table to conserve space.

measures of risk shows no difference between conventional and Islamic banks.

5.2. Ownership nature and bank risk

We now consider the role of ownership nature as it relates to risk taking. Our results are consistent with the hypothesis that different categories of shareholders have different risk attitudes. As reported in models A and B, the coefficients associated with the family variable are significant. Family is positively related to *Z*-score and negatively associated with the credit risk measure (NPLOAN). This result indicates that family-owned banks have relatively low risk, because they hold a less diversified portfolio (Barry et al., 2011). In addition, in order to secure a bank's long term survival, family banks have incentives to take less risky projects (Anderson et al., 2003). Moreover, in these banks, executive managers are limited to family members. This causes alignment with the risk preferences of managers and owners, leading to a decrease in bank's risk. However, other studies (e.g., Laeven, 1999; Nguyen, 2011) find that family-controlled banks are associated with significantly higher risk. They explain the result by the fact that family banks appear to be managed with the aim of being handed over to the next generation. Accordingly, they may be able to undertake high value-creating investments compared to other banks. In addition family-owned banks are more intensively engaged into insider lending than other banks (state owned and foreign-owned banks). By comparing conventional and Islamic banks, we find significant differences between the two types of banks only in terms of credit risk (model B). Family conventional banks tend to have relatively higher levels of credit risk compared to family Islamic banks. We can explain this result by the nature of the activities of Islamic banks which appear to reduce risk by following a profit and loss sharing paradigm (Abedifar et al., 2013). Moreover, family Islamic banks have a small size and are more likely to be relatively new, conservative in their operations and attract clients for religious reasons that are less risky. On the contrary, the empirical results show that the stability of family-owned Islamic banks is not significantly different from

that of family-owned conventional banks. These results denote that family conventional banks tend to have a higher asset risk but not necessarily a higher default probability.

As regards the effect of state ownership on banks' risk taking, we find, in the case of credit risk, that the coefficient of the state variable is significantly positive for credit risk model. Thus, state-owned banks have greater proportions of non-performing loans than other banks. Several studies (e.g., Berger, Clarke, Cull, Klapper, & Udell, 2005; Cornett, Guo, Khaksari, & Tehranian, 2010; Iannotta, Nocera, & Sironi, 2007) have found that the relationship between government participation in banking ownership and risk is positive and significant. According to these studies, state-owned banks have poorer loan quality and higher default risk than privately owned banks. This finding is consistent with the view that government-owned banks are run by political bureaucrats and their decisions are dictated by political interests (Iannotta et al., 2007). However, Cornett et al. (2010) in their study relative to 16 Asian countries find that state-owned banks closed the gap with privately-owned banks in terms of cash flow return, core capital and non-performing loans in the post crises period of 2001−2004. The authors explain this finding by the increasing globalization of financial services, competition which creates a pressure to improve banking policy that disciplines inefficient regulators and enhances the performance of state-owned banks.

As far as the comparison between conventional and Islamic banks is concerned, Table 4 (model B) shows that the state variable is insignificant with *Z*-score, but is slowly significant with the non-performing loans ratio only. It appears that the state Islamic banks have a similar insolvency risk as state conventional banks. However, Islamic banks have a lower exposure to credit risk than conventional banks.

Regarding the influence of company on banks' risk, we do not find in the two models (A and B) any significant coefficient associated with the variable company when the dependent variables are credit risk or *Z*-score. This supports the findings of Abedifar et al. (2013) which found similarities in the credit and solvency risk features of Islamic and conventional banks. Overall, we can say that private Islamic banks are as stable as private conventional banks.

5.3. Control variables

The coefficients on other bank characteristics offer some important insights. In line with several studies (e.g., John et al., 2008; Paligorova, 2010; Sullivan & Spong, 2007), bank size in all models has a negative effect on risk, which confirms the theory that large banks are able to diversify risk because they have more opportunities to pursue a broader range of loans, investments and other activities. In the two models for *Z*-score, the coefficient of the cost to income ratio is negative, implying that banks with lower managerial efficiency are exposed to more bank risk (Shehzad et al., 2010). Return on asset is insignificantly associated with *Z*-score, but displays a strong negative association with credit risk. Contrary to expectations, the coefficients of operating leverage variable (LEVOP) in the models for *Z*-score are significant and have a negative effect on bank risk. However, Mandelker and Rhee (1984) among others have argued that operating leverage has the same impact as financial leverage in increasing bank risk. A similar positive effect is found in the models for credit risk but the variable is not significant. Using data envelopment analysis for banks operating in Turkey, Gunay (2012) shows that efficiency scores are much lower when non-performing loans are incorporated as an undesirable output in the model. Similarly to the study of Abedifar et al. (2013), we do not find any relationship between loan growth and credit risk, and asset growth with insolvency risk. In Table 4, the leverage ratio is negative and significant for two credit risk model. This result which is consistent with previous study (Borio & Zhu, 2008; Delis & Kouretas, 2011) means that higher equity capital implies more prudent bank behaviour. Table 4 also shows, for insolvency risk model, a positive relationship between *Z*-score and diversification proxy. This finding support the argument that diversification into non-banking activities decreases the riskiness of bank.

The results on country-level variables are also interesting. As expected, higher levels of GDP per capita reduce bank risk taking. This result confirms the view that banks from faster-growing countries have a lower portion of bad loans and are less risky (Angkinand & Wihlborg, 2007; Laeven & Levine, 2009). For all models and for the two measures of risk, the coefficient of the proxy of banking sector development is significantly and negatively related to bank risk. This suggests that countries with higher level of banking sector development have lower risk. Shareholders' right are found to be positive related to *Z*-score and negatively associated to credit risk. Therefore, the higher the efficiency of the legal system that protects shareholders, the lower the risk taken by banks. Several studies (e.g., Angkinand & Wihlborg, 2007; Magalhaes et al., 2008) supported these findings. We also identified a positive and significant relationship between the bank concentration variable and *Z*-score. This supports the argument of Sullivan and Spong (2007) that market concentration decreases bank risk by exploiting the moral hazard features of deposit insurance. Finally, contrary to our expectation, we find no significant relationship between interest rate and credit risk.

6. Robustness checks

6.1. Two-stage least squares

The reported coefficient estimates in Table 4 may be biased as risk and ownership might be jointly determined by unobservable factors which violate the consistency of the OLS estimator. Some studies (e.g., Demsetz & Lehn, 1985; Gugler & Weigland, 2003) suggest that ownership is endogenous because it is influenced by the bank's level performance and risk. Then, we potentially have a problem in our regression with the two ownership variables. To address this endogeneity problem, we use an instrumental variable that is correlated with ownership structure and uncorrelated with risk-taking. In

this study, we consider two instrumental variables for each ownership variable (CONC, FAMILY, COMPANY and STATE). The first instrument is the bank age. According to Nguyen (2011), the ownership composition changes as the bank evolves through its life cycle. Many studies (e.g. Black & Gilson, 1998; Claessens, Djankov, & Lang, 2000) suggest that as banks get older, they grow in size and require external funding, as they become more widely held. Following Nguyen (2011) and John et al. (2008), the second instrument represents the average ownership of firms in the same industry group and country. For ownership concentration (CONC), we use the average ownership concentration of others banks in the same industry. For the type of owners, we use the percentage of family or company or state banks among other banks in the same industry. After the choice of the instrument variables, the equations (1) and (2) are estimated using the two-stage-least squares (2SLS) regression. To control for endogeneity, we perform a Hausman test against the corresponding OLS estimates to determine whether the two ownership variables are endogenous. Because we have two exogenous instruments for each endogenous ownership variable, we use the Sargan test and the Basmann test (test of overidentifying restrictions) to ensure that our instrumental variables are exogenous and not redundant.

Table 5
Regression results of bank risk measures on ownership structure variables with 2SLS.

Explanatory variables	Credit risk		Z-score	
	Coef.	t-statist.	Coef.	t-statist.
Ownership variables				
Concentration	−0.267	(−2.76)*	0.658	(3.01)*
Family	−0.564	(2.38)**	0.964	(3.51)*
Company	0.165	−0.91	0.047	−1.12
State	0.375	(2.27)**	0.069	−1.23
Bank-characteristics				
Size	−1.467	(−7.62)*	0.848	(2.49)*
Efficiency	0.006	−0.42	−0.037	(−2.15)**
Profitability	−0.36	(−3.68)*	−0.054	(−0.30)
Operating leverage	0.238	−0.91	0.973	(2.10)**
Loan growth	0.125	−1.23		
Leverage ratio	−0.412	(−2.22)**		
Diversification			0.753	(2.98)*
Asset growth			0.265	−1.76
Financial and economic variables				
Per capita GDP	−0.008	(−3.22)*	0.003	−0.49
Inflation	−0.12	(−1.24)	0.09	−0.79
Insurance deposit	−0.128	(−0.85)	−0.022	(−0.98)
Shareholders rights	−0.432	(−3.67)*	0.771	(3.09)*
Banking sector development	−0.063	(−3.12)*	0.1	(2.69)*
Bank concentration	−0.038	−0.23	0.449	(3.97)*
Interest rate	−0.056	(−0.45)		
Type of banks	0.621	(2.982)*	0.412	−1.169
Year dummy	Yes		Yes	
Country dummy	Yes		Yes	
Number of observation	655		655	
F-value	4.45*			
R^2	0.372			
Sargan test	0.461	−0.856		
Basmann test	0.449	−1.23		
Hausman test of endogeneity	19.143*			

Notes: *t*-statistics are between parentheses. *, ** and *** indicate statistical significance at 1%, 5% and 10%, respectively. The year dummies and country dummies are included in the regressions but their coefficients are not reported in the table to conserve space.

Table 5 presents the findings estimated by using 2SLS regression in which risk is proxied by *Z*-score and the ratio of non-performing loans to total loans. The Hausman test of endogeneity confirms that instruments variables estimate of the coefficient on ownership structure are larger than the OSL, which suggests that OSL may generate biased estimates and in consequence underestimates the true effect of ownership on risk-taking. In addition, the over identification tests of excluded instruments (Sargan and Basmann tests) do not reject the hypothesis that the excluded instruments are uncorrelated with the error term and support the assumption that the instruments are valid. The results are qualitatively similar to our previous findings.

6.2. Others sensitive tests

We also perform several tests to examine the robustness of our major findings using different types of analysis. First, following several studies (Barry et al., 2011; Berger, Hasan, & Zhou, 2009), we substitute continuous variables relative to the nature of the owners with dummy variables to analyse whether banks' risk-taking behaviour depends on the nature of the main type of shareholders. Hence, we add in the equations (1) and (2) three dummy variables which take the value of 1 when ownership is greater than 50% of total equity and 0 if otherwise. Our results, not reported, show that banks which are majority owned by families or companies exhibit a lower risk level compared to state owned banks. We also find a difference between conventional and Islamic banks only in terms of credit risk particularly for family-owned banks. In terms of insolvency risk, no difference was found between conventional and Islamic banks concerning all categories of banks. Second, we use the alternative measure of ownership concentration defined as the total shares of the largest three shareholders instead of the percentage share of the largest shareholder. The results regarding our ownership variables are unchanged. Third, we examine whether the effect of type of owners on risk taking is related to the degree of ownership concentration. The analysis is performed by adding equations (1) and (2) with interactions variables involving the different categories of owners and ownership concentration. The results, not reported, show that the degree of ownership concentration does not influence the relationship between ownership structure and bank risk for both conventional and Islamic banks. Finally, we also examine whether our results are sensitive to the method used (2SLS) concerning the issue of endogeneity problem. Hence, we re-estimate the two equations using GMM method. Overall, the results not reported are qualitatively similar to our previous findings.

7. Conclusion

In view of the rapid growth of Islamic banks around the world and their resilience during the recent global crisis,

several issues are highlighted with regards to the performance of these banks and their influence on financial and economic stability. This paper presents empirical evidence on the differences in risk-taking behaviour between conventional and Islamic banks in MENA countries. We examine the effect of ownership concentration and the nature of owners on the two indicators of bank riskiness, namely *Z*-score and the ratio of non-performing loans to total loans for a sample of 131 banks.

In general, we find that changes in ownership structure are significant in explaining risk differences between banks. Indeed, the results highlight the fact that banks with concentrated ownership have lower insolvency risk and lower asset risk. We find almost no differences related to ownership concentration when we analyse conventional banks and Islamic banks separately. Our findings also reveal that the nature of owners is relevant to explaining risk-taking especially with credit risk measure. More precisely, family owned banks appear to assume lower risks. For this type of shareholders, the results suggest that family Islamic banks have a lower level of credit risk compared to conventional banks. No differences were found between the two types of banks in terms of *Z*-score. For state-controlled banks, the results are in line with the view that government banks had greater credit risk than privately owned banks. In addition, for this indicator we find that state Islamic banks tend to be more stable than state conventional banks. In the case of banks owned by financial and non-financial companies, we find no differences in asset risk and default risk between conventional and Islamic banks. Market forces seem to align the risk-taking behaviour for Islamic banks. Overall, despite the fact that Islamic banks face extra operational risks and concerns because of the complexity of the Islamic modes of finance and limitations in their investment activities (Abedifar et al.., 2013; Cihak & Hesse, 2008), we can conclude that Islamic banks are as stable as conventional banks. However, Islamic banks have a lower exposure to credit risk than conventional banks. This finding can be justified by the argument that Islamic banks are more likely asset-based and followed the form of PLS principles in their transactions. In this context, it is important to note that PLS financing shifts the direct credit risk from banks to the investment depositors but it also increases the overall degree of risk on the asset side of banks' balance sheets (Cihak & Hesse, 2008).

These results have some relevant policy implications. First, as suggested by Abedifar et al. (2013), it is not necessary to develop separate regulatory and supervisory systems for each type of banks as conventional and Islamic banks presented similarities in terms of credit and insolvency risks. Islamic banks should be treated similarly to their conventional counterparts. However, as Islamic banks present particularly risks arising from the specific features of Islamic contracts (Iqbal & Lewellyn, 2002), financial reforms in this region related to the convergence and harmonization of regulations and products are needed to facilitate an efficient and sustainable growth of this sector. Second, the results show that size is relevant to explain bank risk. Therefore, Islamic banks have to draw suitable strategies to establish large entities in order to increase their performance and compete with existing banks. Finally, in the MENA region, an important number of banks are owned by companies. In this case, our results indicate that ownership structure is not a determinant factor in explaining risk differences between conventional and Islamic banks. In consequence, we estimated that the stability of banks especially in countries with two financial systems (conventional and Islamic) is dependent on many other variables such as: the financial and economic environment in the country, the level of market share of Islamic banks, the legal and regulatory framework, and the level of utilization of loss and profit sharing modes by Islamic banks. Therefore, the issue of whether Islamic banks are more or less stable compared to conventional banks warrants further investigation in the future by introducing these variables.

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