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Financial openness, disclosure and bank risk-taking in MENA countries

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Financial openness, disclosure and bank risk-taking in MENA countries[*]

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Abstract

In this paper, we analyze the risk-taking behavior of banks in emerging economies in a context of international capital mobility. Our paper highlights a new channel through which depositors can exercise pressure to control risk taking. Depositors can reallocate their savings away from their home country to the more protective system of a developed economy. We recover a classical result according to which increased competition resulting from more international financial openness induces banks to take excessive risks. We find however that sufficiently high financial openness is necessary for a positive link between financial transparency and safe risk management. Finally, we test the relationship between disclosure, financial openness and bank risk-taking for a panel of 258 banks from the MENA region and Turkey.

Keywords: banking competition, disclosure, bank risk-taking, MENA banking sectors, mock compliance

JEL Classification: G21, G28, F39, L80

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1 Introduction

Efficient risk management in the banking sector is crucial for emerging economies[1]. Because of their highly uncertain environment, these countries are prone to information problems that may cause excessive risk-taking behavior in banking (Vives, 2006). This situation is further aggravated by the low development of their financial markets, which increases the role of banks. The intent of emerging countries to comply with advanced risk management procedures is nevertheless quite remarkable[2]. In 2009, 14 countries, some of which were large emerging countries, became members of the Basel Committee. According to many authors (Powell 2002, Fischer 2002, Llewellyn 2003, Balin 2008), however, the banking systems in emerging economies may face difficulties in adopting the sophisticated approaches initially intended for advanced countries. These authors highlight the structural weaknesses of the financial environment in emerging economies as captured by the low quality of accountancy data, a lack of auditing agencies, problems in accounting and auditing procedures and problems in implementing sophisticated risk measurements. Among emerging economies, the MENA (Middle East and Northern Africa) countries and Turkey are a particularly interesting case. Banking sectors in the MENA region are among the deepest in the emerging and developing world[3]. These sectors underwent a profound transformation through a privatization process and the entry of foreign institutions, but some of them are still in the early stages of financial development and have a weak legal and supervisory environment (Anzoategui et al. 2010, Cigogna 2009). In a recent study of the banking sectors of the MENA region, Turk-Ariss (2009, p. 694) notes, "Monetary authorities in MENA countries generally require banks to adopt international accounting standards and to comply with international regulatory requirements". The stability of the banking sectors in this region is viewed as a condition of the attractiveness of oil surplus funds.

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[1]In this paper, the term emerging economies does not refer to a specific list of countries. Each international organization or rating agency uses its own classification. Due to the lack of a precise definition, we consider emerging economies to be developing countries that are not part of the "Least Developed Countries" group. Our model is adapted to economies characterized by increasing financial integration as well as by a weak financial environment and capital flight.

[2]The 2008 FSI survey (FSI-BIS 2008, p. 2) indicates that 92 non-members of the Basel Committee on Banking Supervision have implemented or are currently planning to implement Basel II. Moreover, 61 % of these non-members intend to offer the Advanced Internal Ratings Based Approach (Advanced IRB).

[3]The MENA region ranks second (behind East Asia) in banking sector development, according to the ratio of bank assets to GDP and the banking sector credit to the private sector as a ratio of GDP over the period 2002-2008 (Anzoategui et al., 2010).

In this paper, we analyze how international competition for deposits may prevent excessive bank risk taking in emerging economies. In particular, we model pressure on the emerging banking system by possible capital outflows to a developed financial center. The quality of the financial environment is addressed by introducing the notion of transparency, defined as the ability of depositors to observe how prudently banks behave.

Our approach is motivated by an increasing degree of openness in emerging economies towards OECD countries. A higher level of openness translates into higher levels of capital mobility. It follows that banks must compete with those of developed countries to keep their depositors domestic[4]. Capital flight, which is particularly high from resource-based MENA economies (Almansour 2008), can be viewed as international competition for deposits. Among the various determinants of capital flight, there is evidence of a lack of confidence in the banking systems of East Asian economies or countries such as Russia (Collier et al. 1999, Loungani and Mauro 2000, Perotti 2002), which have been hit by financial distress.

In this paper, we propose international banking competition as a disciplinary device. Depositors may exert pressure on home banks by reallocating their savings to an external (i.e., foreign) banking system that is more protective. The disciplinary role of depositors on banks has been studied by Calomiris and Kahn (1991), Allen and Gale (1999), Chen (1999) and, from a critical view, Hellwig (2005). The existing literature argues that depositors can punish banks by withdrawing their funds when they do not approve of the bank's behavior. This means of exerting discipline through depositors' behavior is well documented empirically in emerging economies. These studies test the reaction of depositors to high risk taking on the part of banks by analyzing changes in the volume of deposits and the corresponding interest rates. In Latin America, empirical evidence has been found by Barajas and Steiner (2000) for Colombia, by Calomiris and Powell (2001) for Argentina, and by Martinez-Peria and Schmukler (2001) for Argentina, Mexico, and Chile. More recently, Ungan et al. (2008) have shown that deposits significantly increase with the improvement of capital and liquidity ratios in Russia. Similar evidence has also been found by Onder and Ozyildirim (2008) for Turkey.

It is generally argued that the effectiveness of such disciplining behavior crucially depends on the transparency of the banking system. It is also suggested that bank regula-

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[4]The increasing financial openness of emerging countries and its consequences have been well measured by Prasard et al. (2003). With the exception of FDIs, capital has tended to flow from poor to rich countries over the 2000s (Prasad et al. 2006).

tion should impose greater transparency to mitigate moral hazards and to reduce risk taking (Bhattacharya, Boot and Thakor, 1998; Boot and Thakor, 2001; Admati and Pfleiderer, 2000; Cordella and Yeyati, 2002). Our paper specifically studies the interaction between transparency in bank risk taking and the disciplinary role of depositors.

The main theoretical results of this paper can be summarized as follows. In our model, which has been adapted to emerging countries, we recover a classical result according to which increased competition resulting from more international financial openness induces banks to take excessive risks. We find however that sufficiently high financial openness is necessary for a positive link between financial transparency and safe risk management. Indeed, when there is a high degree of financial openness, profit margins are relatively low. In this case, strong financial disclosure, which spurs competition, leads to weak losses. It follows that the attractiveness effect of transparency dominates and makes banks more likely to adopt safe risk management. The implication from the perspective of policy analysis is that promoting successful financial disclosure in an emerging country requires sufficient financial openness.

The theoretical literature closest to our model is Cordella and Yeyati (2002) and Hyytinen and Takalo (2002).

Cordella and Yeyati (2002) develop a model of spatial competition among banks and study the impact of the dissemination of financial information and entry on risk taking. We also use a spatial framework, but in a quite different context. Cordella and Yeyati (2002) model bank competition in a given marketplace and assess the impact of entry of new banks on risk taking. In contrast, our paper is concerned with bank competition between countries at different stages of economic development and the impact of potential capital flight on risk taking in emergent countries. The way Cordella and Yeyati model financial transparency also differs from ours. Similar to Schultz (2004), we account for transparency by introducing informed and uninformed investors.

Hyytinen and Takalo (2002) argue that the transparency required by bank regulation comes at a cost, which in turn can reduce the charter value of banks and increase the fragility of the banking system. Our model shows a similar result, but for quite different reasons.

Finally, after calculating a bank disclosure index adopted from Baumann and Nier (2004), we empirically test the impact of financial openness and disclosure on bank risk taking. Our empirical analysis is applied to Middle East and North Africa (MENA) economies and Turkey. For these countries, we collected individual financial data for 258 banks over the

period from 2005-2008. Many economies in this region have experienced financial liberalization (Crean et al. 2007), and some of them are characterized by a massive capital flight (Almansour 2008). In line with Nier and Baumann (2006) and Demirgüç Kunt et al. (2008), our results confirm the negative relationship between transparency and various risk-taking indicators. Moreover, our regressions show that the financial openness of emerging countries positively impacts risk taking. In light of our theoretical model, this means that the countries in our sample are, on average, characterized by a sufficient degree of financial openness.

This paper is organized as follows. Section 2 presents the model and discusses the behavior toward risk of the banking systems in emerging countries. Empirical evidence on MENA countries is presented in Section 3.

2 The Model

Consider two countries h and f, where h is the emerging country and f is the developed one. Each country contains one banking system[5]. We assume that the emerging country is not attractive to investors in country h. This seems realistic enough due to weak investor protection prevailing in developing countries as already said in the introduction. However, depositors in the emerging region may decide to invest their savings in the developed country.

The population of depositors of the emerging country is uniformly distributed along the linear segment $[0, 1]$ with density 1. The heterogeneity of these depositors captures their preference for proximity. Assume that the domestic bank that is located at position 0, and the foreign bank is located at position 1, which denotes the border between the emerging and developed countries. Then, the "closer" to the origin depositors are, the more they favor their home financial center. Consequently, the subjective mobility cost of an individual located at a distance x ($x \in [0, 1]$) from the origin equals the gap $1 - x$ that separates her from the border multiplied by a constant unit cost k. The higher this coefficient k is, the lower is the international mobility of investors. Hence k may also be used to measure the degree of international financial openness.

BANKS   Banks offer an interest rate r_i $(i = h, f)$ to depositors and lend the deposited funds out to borrowers. Like Chiesa (2001), we assume that lending consists of project fi-

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[5]Since we focus on international bank competition, we assume that the banking system in each jurisdiction reduces to one bank.

nancing. A bank is presumed to take excessive risks if it does not monitor the funded project. Since we focus on the potential risk behavior within the emerging country, we assume without loss of generality that banks in the developed country do not take excessive risks[6]. More precisely, the bank in h chooses strategy $s \in \{m, M\}$, where $s = m$ stands for "excessive risk-taking" and $s = M$ indicates "safe risk management" in the case of monitoring. We consider that choosing a safe risk management strategy M means complying with international prudential rules. Banks in both countries are supposed to be risk-indifferent and have limited liability. If action m is chosen, one unit of resources is invested in a portfolio that yields r with probability p_m and is zero otherwise. Opting for M delivers a return r with probability p_M, with $p_M > p_m$ but it also entails a monitoring cost equal to $c > 0$ (with $r > c$). For the sake of simplicity, we assume that the action M eliminates the credit risk while action m does not[7], that is $p_m = p$ and $p_M = 1$. In what follows, we also assume that $p \in \left(\frac{1}{2}, 1\right)$. Finally, we consider a deposit insurance scheme specific[8] to each country, in which a fraction β_i $(i = h, f)$ of deposits, $0 < \beta_i < 1$ is refunded to depositors if a bank fails. Without loss of generality, we assume $\beta_f = 1$ and let $\beta_h = \beta$. We suppose that implementing safe risk management is efficient[9]. This implies that $1 + r > c/(1 - p)$.

TIMING   The timing of the model is shown in the following figure.

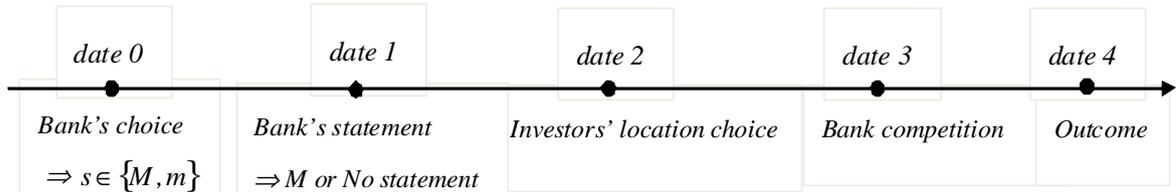| date 0	date 1	date 2	date 3	date 4
Bank's choice	Bank's statement	Investors' location choice	Bank competition	Outcome
$\Rightarrow s \in \{M, m\}$	$\Rightarrow M$ or No statement			

Figure 1

At date 0 the banking sector in country h chooses a strategy $s \in \{m, M\}$ and at date 1 it states if it complies with international prudential standards (choice of $s = M$) or it makes no statement. Banks in developing countries often have substantive implementation

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[6]This must not be interpreted in absolute terms but in comparison to the behavior of the emerging banking system.

[7]This is not equivalent to perfect risk diversification since risk-mitigating costs are incurred.

[8]For the sake of simplicity, we assume that the deposit insurance is funded by non-distorting taxation.

[9]In other words, the expected net gain induced by sound risk management $(1 + r - c)$ exceeds the expected net gain induced by excessive risk-taking, $p(1 + r)$

costs of international regulatory standards and resist to effective compliance (Walter, 2010). Officially reporting compliance does not therefore necessarily translate into facts and mock compliance (Walter, 2010) is very likely to occur. An additional complication is that real compliance is difficult to assess by outside observers (Walter, 2010). This follows from the lack of skilled accounting and auditing professionals and the high cost in implementing international accounting and disclosure standards (United Nations, 2008). Financial systems in developing countries have thus low capacity to disclose relevant information to investors. We model this imperfect transparency by considering like Schultz (2004) that the investors are composed of informed and uninformed agents. We assume that the informed investors represent a fraction α $(0 \leq \alpha \leq 1)$. They are endowed with sufficiently high expert skill allowing them to exactly perceive the chosen risk strategy by the banking sector. The remaining fraction α $(0 \leq \alpha \leq 1)$ are uninformed investors. For the sake of simplicity, we suppose that these agents can by no means observe the actual risk behavior (M or m) chosen by the home banking sector. More precisely, they lack expert knowledge to such an extent that they think that mock compliance occurs when the banking sector officially states compliance with international standards. Missing information entices uninformed investors to be prudent and to assume the status quo in risk taking even if the bank announces compliance. We also assume that these investors are so unsophisticated that they are not able to extract valuable information about risk taking from interest rates. In the sequel we use the parameter α as a proxy for the degree of financial transparency and we assume that the fraction of informed investors increases with the degree of financial disclosure.

At date 2, the investors choose where to invest according to their knowledge about the risk strategy chosen by their home country's banking sector. At date 3, the banking sectors compete by setting the deposit rates offered to the investors. Finally at date 4 the depositors' investments materialize. It follows that investors learn the risk strategy chosen by their home country bank after having deposited their money.

INVESTORS   Investors select the country that offers the highest expected return net of mobility costs. The expected utility of "informed" investors located at $x_I, x_I \in [0, 1]$ and who invest in their own country h is given by

$$U_h(x_I) = \begin{cases} p(1 + r_h) + (1 - p)\beta & \text{if} \quad s = m \\ 1 + r_h & \text{if} \quad s = M \end{cases}$$

If she invests in country f, her expected utility becomes

$$U_f(x_I) = (1 + r_f) - k(1 - x_I)$$

The expected utility of the uninformed investor located at x_U, $x_U \in [0,1]$ who invests in her own country h is given by

$$U_h(x_U) = p(1 + r_h) + (1 - p)\beta \quad \text{if } s \in \{m, M\}$$

If she invests in country f, her expected utility becomes

$$U_f(x_U) = (1 + r_f) - k(1 - x_U)$$

If the bank in the emerging country chooses strategy M, the marginal informed and uninformed investors' locations respectively become

$$x_I^M = \frac{r_h - r_f}{k} + 1$$
$$x_U^M = \frac{p(1 + r_h) - (1 + r_f) + \beta(1 - p)}{k} + 1$$

The market share x^M of the bank in country h if the prudent strategy is selected is obtained by calculating $x^M = \alpha x_I^M + (1 - \alpha)x_U^M$ which yields

$$x^M = \frac{\theta(1 + r_h) - (1 + r_f) + \beta(1 - \theta)}{k} + 1, \tag{1}$$

where $\theta = \alpha + (1 - \alpha)p$. If there is perfect transparency, all investors ($\alpha = 1$) are informed and if the bank chooses the safe strategy M it follows that $\theta = 1$. In case of perfect opacity, we have $\alpha = 0$ and consequently $\theta = p$.

If there is no compliance reported by the jurisdiction h or if there is mock compliance, the bank in the emerging country takes excessive risk. The informed and uninformed investors will choose the destination of their investment consistently with the strategy m adopted by the domestic bank. The deposit supply faced by the bank in country h equals

$$x^m = \frac{p(1 + r_h) - (1 + r_f) + \beta(1 - p)}{k} + 1.$$

2.1 Excessive risk-taking

Each banking system selects the interest rate that maximizes its own profit taking the rival's rate as given.

$$\underset{r_h}{Max} \ \Pi_h^m = px^m(r - r_h)$$

$$\underset{r_f}{Max} \ \Pi_f^m = (1 - x^m)(r - r_f - c).$$

Solving the system of first order conditions yields the interest rates r_h^m and r_f^m [10]

$$r_h^m = r - \frac{2k - (1-p)(1+r-\beta) + c}{3p} \qquad (2)$$

$$r_f^m = r - c - \frac{k + (1-p)(1+r-\beta) - c}{3} \qquad (3)$$

The corresponding market share of h is

$$x_h^m = \frac{2k - (1-p)(1+r-\beta) + c}{3k}, \qquad (4)$$

Consequently, the market share for f is $x_f^m = 1 - x_h^m$. Since sound risk management is efficient, we have $x_h^m \in (0, 1)$ if and only if

$$k > \bar{k}_1 = \frac{(1-p)(1+r-\beta) - c}{2}. \qquad (5)$$

Profits of banks in h and f can be written as

$$\Pi_h^m = (x_h^m)^2 k$$
$$\Pi_f^m = (1 - x_h^m)^2 k$$

2.2 Sound risk management

Under sound risk management, the market share of the bank in the emerging country is given by (1). Consequently, each bank selects the interest rate that maximizes its own profit by taking the rival's rate as given.

$$\underset{r_h}{Max}\ \Pi_h^M = x^M (r - r_h - c)$$
$$\underset{r_f}{Max}\ \Pi_f^M = (1 - x^M)(r - r_f - c)$$

After solving the system of best replies, we obtain the following interest rates [11]

$$r_h^M = r - c - \frac{2k - (1-\theta)(1+r-c-\beta)}{3\theta} \qquad (6)$$

$$r_f^M = r - c - \frac{k + (1-\theta)(1+r-c-\beta)}{3} \qquad (7)$$

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[10] The offered interest rates $r_i^m (i = h, f)$ are positively signed for a sufficiently large r.

[11] As above, a sufficiently large r guaranties that $r_i^M (i = h, f)$ are positive.

The corresponding market share of h becomes

$$x_h^M = \frac{2k - (1 - \theta)(1 + r - \beta - c)}{3k},$$

which belongs to the interval $(0, 1)$ if and only if $k > \bar{k}_2 = \frac{(1-\theta)(1+r-c-\beta)}{2}$. The feasibility set of k reduces to $k > \bar{k} = \max\{\bar{k}_1, \bar{k}_2\}$. Notice that $\bar{k} = \bar{k}_1$ if $1 + r - \beta \in \left(\frac{c}{1-p}, \frac{\theta c}{\theta - p}\right)$ and $\bar{k} = \bar{k}_2$ if $(1 + r - \beta) \in \left(\frac{\theta c}{\theta - p}, +\infty\right)$ with $p \leq \theta < 1$.

The equilibrium profit functions are given by

$$\Pi_h^M = \left(x_h^M\right)^2 \frac{k}{\theta},$$
$$\Pi_f^M = \left(1 - x_h^M\right)^2 k.$$

Notice that decreasing transparency (θ) increases the profit function Π_h^M. The reason is that lower transparency softens international bank competition and makes depositors more captive.

2.3 Choice of risk management strategy

In this section, we study the incentives of the emerging country to comply with safe risk management. The emerging country chooses M if the difference $\Pi_h^M - \Pi_h^m$ is positively signed. The following proposition may thus be stated.

Proposition 1. *There exists a cost threshold ($c^* > 0$) under which the banking system of country h adopts safe risk management.*

Proof:

The threshold-value $c^* = \frac{2k - (1-\theta)(1+r-\beta) - \sqrt{\theta}(2k-(1-p)(1+r-\beta))}{\left(\theta + \sqrt{\theta} - 1\right)}$ is derived from the equality $kS\left[\left(\frac{x_h^M}{\theta}\right)^2 - (x_h^m)^2\right] = 0$. It follows that $c^* > 0$ if $k > \max\left\{\bar{k}, \tilde{k}\right\}$, where $\tilde{k} = (1 + r - \beta)\left((1 - \theta) - (1 - p)\sqrt{\theta}\right)/2\left(1 - \sqrt{\theta}\right)$[12].

Consequently, the sound strategy M is chosen if the cost of monitoring is not too high (i.e. $c \leq c^*$), whereas the banking system opts for risk-taking (m) if $c > c^*$. The limiting case

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[12]Notice that $\tilde{k}$ is strictly positive if $\theta \geq p > \left(\theta + \sqrt{\theta} - 1\right)/\sqrt{\theta}$. If $\theta \geq \left(\theta + \sqrt{\theta} - 1\right)/\sqrt{\theta} > p$ holds, we have $\tilde{k} < 0$. In this case it follows that for any value of the net return $1 + r - \beta$ we get $c^* > 0$.

where depositors are uninsured ($\beta = 0$) in the emerging country and financial disclosure is perfect ($\theta = 1$), the banking system in country h always chooses safe risk management.

It is easy to show that $\partial c^*/\partial k = -\frac{2\sqrt{\theta}-2}{\theta+\sqrt{\theta}-1} > 0$ for any θ, such as $\theta > p > 1/2$. We therefore can state the following proposition.

Proposition 2. *The higher the level of financial openness, the more likely the banking system in the emerging country will adopt excessive risk.*

Indeed, a higher degree of financial openness fuels banking competition and puts an upward pressure on the offered interest rates. Since we have $\left|\partial r_h^m/\partial k\right| > \left|\partial r_h^M/\partial k\right|$, the bank in the emerging country is enticed to mitigate this stronger pressure by switching to a high risk-taking strategy (m). It also appears that increasing transparency mitigates this effect. This is in line with the theoretical literature about bank competition and risk taking (Cordella and Yeyati, 2002).

Let us now investigate the influence of increased transparency (higher information disclosure) on the choice of sound risk management (M). Calculating the derivative of the threshold cost c^* with respect to θ and with respect to π yields $\partial c^*/\partial\theta > 0$ if $\max\left\{\bar{k}, \tilde{k}\right\} < k < k^{*13}$, and $\partial c^*/\partial\theta > 0 < 0$ if $k > k^*$ with $k^* = p\left(1+\theta\right)\left(1+r-\beta\right)/2\left(2\sqrt{\theta}-\theta\right)$. We can thus state the following proposition.

Proposition 3. *Given sufficient financial openness, higher disclosure makes the emerging banking system more likely to opt for sound risk management. In contrast, if capital mobility is low, higher disclosure decreases the likeliness of sound risk management.*

To understand the intuition behind Proposition 3, we first totally differentiate the equality $\Pi_h^M(c^*, \theta) - \Pi_h^m(c^*) = 0$ with respect to θ and c^*. This yields

$$\frac{dc^*}{d\theta} = \frac{\frac{\partial\Pi_h^M}{\partial\theta}}{\frac{\partial\Pi_h^m}{\partial c^*} - \frac{\partial\Pi_h^M}{\partial c^*}}.$$

It can be shown that the expression in the denominator is positive for all $\theta \in [p, 1]^{14}$. Then $dc^*/d\theta$ has the same sign as $\partial\Pi_h^M/\partial\theta$. Analyzing this last term gives

$$\frac{\partial\Pi_h^M}{\partial\theta} = \underbrace{\frac{2S}{3\theta}x_h^M(1+r-\beta-c)}_{+} + \underbrace{\left(x_h^M\right)^2\frac{-kS}{\theta^2}}_{-},$$

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[13] Since we assume that $p \in \left(\frac{1}{2}, 1\right)$, it is easy to check that $k^* > \max\left\{\bar{k}_1, \bar{k}_2\right\}$ and $k^* > \tilde{k}$.

[14] The denominator equals $\frac{2S}{3}\left(x_h^m - x_h^M\frac{(1-\theta)}{\theta}\right) > 0$. The equality $\Pi_h^M(c^*, \theta) = \Pi_h^m(c^*)$ implies $x_h^M(c^*)\frac{1}{\sqrt{\theta}} = x_h^m(c^*)$. Since $p \leq \theta \leq 1$, and $p \in \left(\frac{1}{2}, 1\right)$, it follows that $x_h^m \geq x_h^M$ at c^*.

Thus, increasing transparency has two opposite effects. On the one hand, banks have an incentive to behave more prudently, since higher transparency increases attractiveness to depositors. On the other hand, more transparency spurs bank competition[15], which squeezes profit margins and thus leads to more bank risk-taking. Notice that the higher the mobility cost k, the stronger the profit squeeze[16]. Which effect will ultimately dominate depends on the degree of financial openness. When the level of financial openness is high ($k < k^*$), the profit squeeze induced by higher transparency (increased θ) is dominated by the attractiveness effect. However, when capital mobility is low ($k > k^*$) the opposite happens.

3 Empirical Analysis

3.1 Estimated equation and data coverage

In this section, we test empirically how bank risk-taking in emerging economies may be affected by disclosure (Discl) and financial openness (Kaopen), giving empirical support to our results in Propositions 2 and 3. For this purpose, we estimate the following model for a cross country sample of banks :

$$Risk_{ik} = f(Discl_{ik}, Kaopen_k, X_{ik}, X_k),$$

where subscripts i and k refer to bank and country respectively, while X_{ik} and X_k are vectors of control variables at bank and country-level .

Our data set comprises 258 banks in 12 MENA countries (Algeria, Egypt, Israël, Jordan, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, Turkey and United Arab Emirates) and Turkey. The data used to calculate the bank-level variables are collected from Bankscope dataset, over the period 2005-2008. We distinguish between two sub-periods, with and without including 2008, which is the first year of the recent financial crisis. All

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[15]Increasing market transparency increases deposit supply elasticity and thus intensifies competition perceived by the emerging country's bank. Indeed, it is easy to check that $\frac{\partial e_h}{\partial \theta} > 0$ with $e_h = \frac{\partial x_h^M}{\partial r_h} \frac{r_h}{x_h^M}$. A similar argument is developed by Schultz (2004) .

[16]This is because high profit margins (induced by a high mobility cost) imply larger losses if transparency increases.

variables except Discl (2007) and Kaopen (2007) are averaged over the periods under study: 2005-2007 or 2005-2008. We cannot exploit the time-series dimension of our dataset because of the lack of variability in the disclosure and financial openness variables. We therefore conduct our analysis on a cross-sectional basis. Considering a short period may be viewed as an advantage. Indeed, if it happens that the banks which provide poor financial information are the most likely to exit from the sample, it is crucial to shorten the observed period as much as possible.

3.2 Measuring disclosure

We calculate a Bank Disclosure Index for each bank of the MENA Region, based on a framework originally proposed by Erlend Nier from the Bank of England (Baumann and Nier 2004), later used by Huang (2006) and by Nier and Baumann (2006).

The Disclosure Index aggregates information originating from six categories, including: (1) Loans; (2) Other earning assets; (3) Deposits (4) Other funding; (5) Memo lines; (6) Incomes. A sub-index is created for each category of disclosure. These sub-indices further contain a total of seventeen items, which are listed in Appendix 1. They measure the level of detail provided by banks about seventeen dimensions of accounting information in their published accounts and provided by Bankscope database.

This index is used at the individual bank-level. To give a picture of the situation of MENA countries, we calculated a national index by averaging the index values of individual banks in a country, weighted or not by their assets (Figure 1). As expected, we obtain in figure 1 a high level of disclosure for Jordan, Israel and some Gulf countries. The calculated index for the Turkish banking sector appears to be relatively high. This is in line with the decision taken by the Turkish authorities, in the wake of the massive banking crisis in 2001, to commit to regulation reforms by introducing a more severe control system augmented by stricter rules (Cimenoglu et al. 2009). By contrast, Algeria and Syria banking systems show very low disclosure indexes.
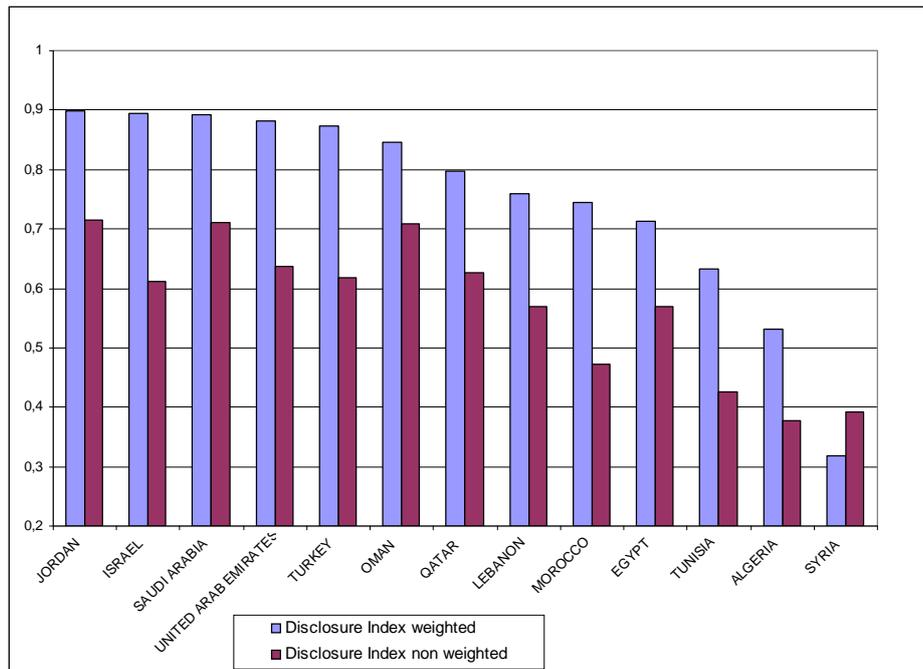
Figure 2: Disclosure Index (2007)

3.3 Bank risk-taking variables

We use three different measures of bank risk-taking, or inversely bank soundness, calculated from bank balance sheet data provided by Bankscope: a *liquidity index*, a *leverage ratio* and a *z-score*. Although these variables are imperfect indicators of risk-taking, they are widely employed in the empirical literature. Moreover, in the light of the recent financial crisis, liquidity and leverage ratios are viewed as key indicators for bank risk-taking by reports of regulators. They recommend to introduce liquidity and leverage ratios to supplement the existing regulatory parameters (FSA, 2009, BCBS 2009).

The liquidity ratio is measured by liquid assets to total assets. Generally, banks with higher ratios are perceived as being safer because of the risk mitigating character of liquid assets which allow to meet unexpected withdrawals. Demirgüc-Kunt and Huizinga (2004, p. 383) consider liquidity as one of the most reliable accounting measures of bank risk, in particular for the developing countries. Equity and profit ratios would be more subject to accounting manipulation and tend to be overstated at weak banks.

The leverage indicator is expressed as the ratio of total assets to total book equity capital. Banks typically increase their risk-taking by borrowing to acquire more assets, with the aim of raising their return on equity. According to the Turner Report (FSA, 2009, p. 67), using

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this leverage ratio in addition to liquidity is very important. Indeed, the crisis revealed that assets which are believed to be of the low risk type can become highly illiquid and risky when systemic problems emerge.

The z-score represents a universal measure of soundness in banking related studies. This index inversely proxies banks' failure probability. Its merit is to combine profitability, solvability and volatility in a relative simple measure solely based on accounting information. It is defined by:

$Z_i = \frac{ROA_i + E/TA_i}{\sigma ROA_i}$, where ROA_i is the period-average return on assets for bank i, E/TA_i stands for the period average equity to total assets, and σROA_i represents the standard deviation of ROA that captures the volatility of returns. The z-score increases with high profitability and capitalization levels and decreases in return volatility. Larger values of the z-score imply lower risk-taking and thus greater bank soundness.

3.4   Financial openness and control variables

To measure financial openness, which is a key variable of our theoretical model, only country-level variables are available. We use the *Kaopen* index which is widespread in financial integration studies. This proxy of openness in capital transactions developed by Chin and Ito (2002, 2006) aims at measuring the extensity of capital controls based on the information from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).

The *Kaopen* index is based on binary variables indicating restrictions on current account and capital account transactions. It takes also into account the presence of multiple exchange rates and the requirement of the surrender of export proceeds. This index takes on higher

values the more open the country is to crossborder capital transactions. A new statistical series of Kaopen index is provided by Chinn and Ito (2007) for 182 countries, updated until 2007.

To isolate the impact of disclosure and financial openness on bank risk-taking (or soundness), we use a number of bank-level and country-level control variables. Empirical literature on bank risk-taking controls always for bank size which is proxied by the natural logarithm of total assets. As noted by Gonzalez (2005), the effect of the bank size is not easy to forecast because under a "too big to fail" behavior, larger banks may have greater incentives to take

risk than smaller banks. On the other hand, larger banks have greater potential to diversify and reduce their risk-taking attitude. In complement to the bank size, we use the variable share defined as the contribution of each bank to the total assets in the banking sector of each country. Following Berger et al. (2009), we control for asset composition of banks.

The indicators are *the share of total loans in total assets* and the ratio of *fixed assets to total assets*. They control for the difference in the structure of bank business. Traditionally, the *public* ownership of a bank is captured by a dummy variable set to 1 when government's ownership exceeds 50%.

To take into account the macroeconomic environment at the country-level, we control for the degree of economic development using the real GDP per capita, the real GDP growth and the inflation rate. Finally, in the MENA region, some economies are strongly resource-based (oil and gas exporters). For this reason, we introduce the dummy variable *res* that takes the value 1 for oil or gas exporters. Bank and country-level variables used in our empirical analysis are summarized in table 1. The descriptive statistics for bank-level variables and the correlations among variables are shown in Appendix 2.

Variable	Description	Source
LIQUID_TA	Liquid asset to total asset; values averaged over 2005-2007 and 2005-2008	Bankscope
LEVERAGE	Ratio of total assets to total book equity capital, average over 2005-2007 and 2005-2008.	Bankscope
Z-SCORE	Average return on assets (ROA) plus equity-asset ratio, divided by the standard deviation of ROA. To calculate σ_{ROA}, we use data from the six previous years (2003-2008)	Bankscope
DISCL	Disclosure index, as defined by Baumann and Nier 2004, see description in main text, year 2007	Bankscope
KAOPEN	Proxy of openness degree in capital account transactions developed by Chinn and Ito (2002 and 2006), year 2007.	Chinn and Ito (2007)
SIZE	Natural logarithm of value of bank total assets, average over 2005-2007.	Bankscope
SHARE	Contribution of each bank to the total assets in the banking sector of each country, average over 2005-2007	Bankscope
LOANS	Loans to total assets ratio, average over 2005-2007	Bankscope
FIXEDASSET	Fixed assets to total assets ratio, average over 2005-2007	Bankscope
PUBLIC	Dummy variable that takes the value 1 when government exceed 50% of total bank ownership and takes 0 otherwise.	Bankscope
GDPCAP	GDP per capital of each country, average over 2005-2007.	WB
GDPGR0507	GDP growth rate of each country, average over 2005-2007.	WB
GDPGR0007	GDP growth rate of each country, average over 2000-2007.	WB
INFLATION	Inflation rate of each country, average over 2005-2007.	WB
RES	Dummy variable that takes the value 1 for oil or gas exporter country.	

Table 1: Variables definitions and data sources

3.5 Results

Table 2 presents the results for our main regressions. All of them are estimated using OLS, and standard errors are adjusted because of heteroscedasticity by the White method. In these equations, we regress risk-taking indicators (leverage) or soundness indicators (Liquidity and z-score) on financial openness, disclosure and control variables.

In a nutshell, these regressions yield significant results with signs consistent with our theoretical model. We obtain more precise coefficients for liquidity and leverage equations than for z-score.

In columns (1) and (3), the dependent variables are measured over the period 2005-2007. In column (2) and (4) we repeat the same estimation by including 2008 which is the first year of the recent financial crisis. It appears that in both estimations the results are very close.

In line with proposition 2, we find that the financial openness proxy (KAOPEN) affects liquidity (the soundness indicator) negatively and leverage (the risk indicator) positively . The financial openness variable is not significant in the z-score regression.

There is clear evidence that the disclosure index (in log) influences liquidity and z-score positively, and leverage negatively. These very significant results in all our regressions are consistent with proposition 3 according to which more disclosure increases the likeliness that the banking system opts for sound risk management in case of sufficient financial openness.

As regards the bank specific control variables, we find that higher bank size (log of total bank assets) is associated with relatively higher risk-taking and lower soundness. This evidence confirms the results obtained by the empirical literature on bank risk-taking. On the other hand, the banks'share in the total assets of their home (banking) sector is significant and negative only in the liquidity regression. The bank soundness, measured by liquidity seems to be affected by the structure of their balance sheet (share of total loans in total assets). Berger et al. (2009) obtained recently a similar relationship.

Among the country-level characteristics, the dummy variable RES (oil and gas exporters) is significant in explaining bank-soundness and bank risk-taking which are respectively captured by liquidity and leverage. The annual GDP growth affects liquidity positively and leverage negatively. In addition, we find that higher per capita GDP is only consistent with lower liquidity.

VARIABLES	(1) LIQUID_TA	(2) LIQUID_TA0508	(3) LEVERAGE	(4) LEVERAGE0508	(5) LNZSCORE
DISCL	0.0705***	0.0624***	-2.945**	-3.101**	0.352**
	(0.0237)	(0.0236)	(1.360)	(1.296)	(0.156)
KAOPEN	-0.00877**	-0.00819*	0.772***	0.699***	0.0295
	(0.00432)	(0.00430)	(0.210)	(0.203)	(0.0308)
SIZE	-0.0474***	-0.0439***	0.920***	1.004***	2.911
	(0.00673)	(0.00623)	(0.324)	(0.317)	(2.618)
SHARE	0.462***	0.449***	9.772	7.699	1.360**
	(0.0955)	(0.0897)	(7.110)	(6.875)	(0.672)
LOANS	-0.666***	-0.626***	1.096	0.681	-2.802
	(0.0445)	(0.0458)	(2.096)	(1.935)	(2.567)
GDPGR0507	0.0159***	0.0153***			
	(0.00526)	(0.00518)			
RESS	0.0491**	0.0497**	-4.284***	-3.506**	0.0760
	(0.0210)	(0.0214)	(1.371)	(1.393)	(0.126)
GDPCAP	-1.45e-06**	-1.81e-06***	3.01e-05	2.09e-05	-1.65e-06
	(7.22e-07)	(6.97e-07)	(4.49e-05)	(4.29e-05)	(5.01e-06)
GDPGR0007			-1.621***	-1.566***	0.0581
			(0.363)	(0.337)	(0.0417)
Constant	0.917***	0.878***	16.22***	15.72***	-0.551
	(0.0877)	(0.0890)	(5.004)	(4.910)	(0.681)
Observations	238	238	205	207	166
R-squared	0.700	0.691	0.369	0.358	0.131

Heteroskedasticity consistent standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: OLS Regressions

Potential endogeneity problems may affect the measured impact of disclosure on risk-taking variables. For example, banks' decision to disclose few informations could be explained by the desire to hide a high risk-taking behavior. More precisely, an inverse causality between risk-taking and disclosure could be suspected. Nier and Baumann and (2006, p. 344) consider that the endogeneity bias for disclosure variables is less plausible in a cross-sectional setup. Nevertheless, we address this potential problem by using instrumental variables estimations (Two stages least squares) adapted to the existence of heteroskedasticity. The choice of instruments is however relatively limited in a cross-sectional analysis. We tested a lot of bank level variables, including public ownership and foreign ownership, and country level variables of governance which may be correlated with our disclosure variable. The only significant instrument we found is public ownership. In the literature of corporate governance applied to banks in developing countries there is evidence about a positive relationship between the status of public ownership and disclosure. For instance, Arun and

Turner (2004, p. 374) consider that one reason of government ownership is the severe information problems inherent in developing financial systems. Using only one instrument does however not allow asserting the validity of instruments by an overidentification test. Nevertheless, public ownership seems not to be significant in econometric works analyzing the bank risk-taking (Angkinand and Wihlborg 2010, Berger et al 2009, Gonzales 2005, Barth et al 2004). In all our IV regressions, we use the Stock and Yogo test for verifying that there is no concern about weak instruments. We show that the Cragg-Donald and Kleibergen-Paap F-statistics are above 10 and exceed the tabulated value.

VARIABLES	(1) LIQUID_TA	(2) LIQUID_TA0508	(3) LEVERAGE	(4) LEVERAGE0508	(5) Z-SCORE
LNDISCL	0.198*	0.114	-11.10**	-10.67**	0.250
	(0.105)	(0.0961)	(4.838)	(4.658)	(0.429)
KAOPEN	-0.0122**	-0.00959*	1.018***	0.938***	0.0361
	(0.00532)	(0.00503)	(0.283)	(0.275)	(0.0350)
SIZE	-0.0635***	-0.0504***	2.073***	2.063***	2.565
	(0.0144)	(0.0135)	(0.729)	(0.713)	(2.447)
SHARE	0.601***	0.505***	0.174	-1.147	1.517**
	(0.170)	(0.142)	(8.665)	(8.710)	(0.734)
LOANS	-0.684***	-0.633***	3.214	2.540	-2.361
	(0.0475)	(0.0459)	(3.050)	(2.782)	(2.386)
GDPGR0507	0.0125**	0.0139**			
	(0.00617)	(0.00581)			
RESS	0.0554**	0.0522**	-4.670***	-3.927***	0.0519
	(0.0237)	(0.0222)	(1.400)	(1.370)	(0.144)
GDPCAP	-1.72e-06**	-1.92e-06***	3.80e-05	3.05e-05	-1.48e-06
	(8.08e-07)	(7.28e-07)	(4.74e-05)	(4.43e-05)	(5.29e-06)
GDPGR0007			-1.360***	-1.325***	0.0567
			(0.444)	(0.417)	(0.0409)
Constant	0.651***	0.771***	31.02***	29.62***	-0.176
	(0.232)	(0.209)	(10.53)	(10.10)	(1.729)
Observations	238	238	205	207	173
R-squared	0.659	0.684	0.173	0.177	0.136

Heteroskedasticity consistent standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3: Instrumental Variables Regressions (2SLS)

4 Conclusion

The aim of this paper is to analyze how international competition for deposits and information disclosure affects banks' risk-taking behavior in emerging countries. The model we develop is also tested econometrically using data on MENA countries.

Briefly, we build a model that indicates for which levels of financial openness and disclosure of information implementing international regulatory standards in developing and emerging countries is a winning strategy. One of our main results is that growing financial openness increases the likelihood of the emerging banking center's compliance with safe risk management. It appears that the effect of information disclosure on risk taking is ambiguous. On the one hand, greater financial transparency increases the attractiveness of deposits and incentivizes banks to behave more prudently. On the other hand, greater disclosure spurs bank competition and squeezes profit margins. However, the first effect over-weights the second effect only if the level of financial openness is sufficiently high. From the point of view of policy analysis, this implies that promoting successful financial disclosure in an emerging country requires sufficient financial openness.

Our empirical analysis is based on a disclosure index computed at the bank level. After controlling for bank- and country-level characteristics, we test the impact of financial openness and disclosure on several risk-taking variables. The risk indicators have been chosen for their relevance during the recent financial crisis. The MENA region plus Turkey is not perfectly homogenous, but many of these economies can be considered emerging and are characterized by massive capital flight. The regressions yield results consistent with our theoretical propositions. We find a significant negative relationship between the proxy of financial openness and the risk-taking indicators. There is also clear evidence that disclosure positively impacts the soundness indicators. Finally, instrumental variable regressions confirm these results.

5 Appendix

The bank disclosure indexes measure the level of detail that banks provide on seventeen dimensions of accounting information in their published accounts and provided by Bankscope database. For all indexes, zero was assigned if there was no entry in any of the corresponding categories and 1 otherwise, except for the index for securities by "type" and the "capital" index. For the "securities by type" item, a 0 was assigned if there was no entry for any of the associated disclosure categories, a 1 if there was only an entry for the coarse breakdown and a 2 if there was an entry for the detailed breakdown. For the "capital" item, a 0 was assigned if there was no entry in any of the categories, a 1 if there was one entry only, a 2 if there were two entries and a 3 if there were three or four entries. Aggregating the information scores on the 17 disclosure items, the composite index can be created with the following formula:

$Discl = \frac{1}{21}\sum_{i=1}^{17} s_i$

Subindex Categories:

1.Loans:

S1: Loans by maturity:

Less than three months, three to six months, six months to one year, one to five years, more than five years

S2: Loans by type:

Loans to municipalities/government, mortgages, HP/lease, other loans

S3: Loans by counterpart:

Loans to group companies, loans to other corporates, loans to banks

S4: Problem loans:

Total problem loans

S5: Problem loans by type:

Overdue/restructured/other nonperforming

2.Other earning assets:

S6: Securities by type:

Detailed breakdown: Treasury bills, other bills, bonds, CDs, equity investments, other investments Coarse breakdown: government securities, other listed securities, non listed securities

S7: Securities by holding purpose:

Investment securities, trading securities

3. Liabilities Deposits:

S8: Deposits by maturity:

Demand, savings, less than three months, three to six months, six months to one year, one to five years, more than five years

S9: Deposits by type of customer:

Bank deposits, municipal/government

4. Other funding

S10: Money market funding:

Total money market funding

S11: Long-term funding:

Convertible bonds, mortgage bonds, other bonds, subordinated debt, hybrid capital

5. Memo lines

S12: Reserves: Loan loss reserves (memo)

S13: Capital: Total capital ratio, tier 1 ratio, total capital, tier 1 capital

S14: Contingent liabilities: Total contingent liabilities

S15: Off-balance-sheet items: Off-balance-sheet items

Income statement

S16: Non interest income: Net commission income, net fee income, net trading income

S17: Loan loss provisions: Loan loss provisions

Variable	Obs	Mean	Std. Dev.	Min	Max
LIQUID_TA	238	.3248649	.1954829	.000601	.9628144
LIQUID_TA0508	250	.3176826	.1900415	.000601	.9608909
LEVERAGE	215	46.76851	527.0663	1.094968	7737.987
LEVERAGE0508	217	46.41075	524.6199	1.101905	7737.987
ZSCORE	168	3.996603	3.481365	.0615685	21.80216
DISCL	238	62.42497	18.06581	4.761905	95.2381
SIZE	238	14.26853	1.747947	8.545911	17.76788
SHARE	238	.0519788	.0846086	0	.7403478
LOANS	238	.4612948	.2219005	0	.9892076
FIXEDASSETS	236	.0098002	.0201764	0	.2383549
PUBLIC	238	.4663866	.4999202	0	1

Table 4: Summary Statistics

Countries	Number of banks
Algeria	14
Egypt, Arab Rep.	28
Israel	14
Jordan	15
Lebanon	38
Morocco	14
Oman	8
Qatar	11
Saudi Arabia	13
Syrian Arab Republic	12
Tunisia	17
Turkey	46
United Arab Emirates	28
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Table 5: Number of banks included in the sample

	DISCL	SIZE	SHARE	LOANS	PUBLIC	GDPGR 0507	GDPGR 0007	GDPCAP	RESS	KAOPEN
DISCL	1.0000									
SIZE	0.5680*	1.0000								
SHARE	0.1321	0.5614*	1.0000							
LOANS	0.2973*	0.2508*	0.0678	1.0000						
PUBLIC	0.4958*	0.4073*	0.1948*	0.3739*	1.0000					
GDPGR0507	0.3490*	0.1243	-0.0300	0.3360*	0.3128*	1.0000				
GDPGR0007	0.2713*	0.0650	-0.0048	0.2864*	0.3070*	0.9128*	1.0000			
GDPCAP	0.3497*	0.1974*	0.0913	0.2659*	0.3192*	0.5524*	0.7122*	1.0000		
RESS	0.1720*	0.1408	0.1679*	0.2698*	0.2201*	0.2263*	0.3936*	0.6835*	1.0000	
KAOPEN	0.2761*	0.1267	0.0113	0.0478	0.0482	0.2791*	0.2653*	0.4322*	0.3152*	1.0000

Table 6: Correlation matrix of main explanatory variables

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