The nature of smoothing returns practices: the case of Islamic banks

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Abstract

Purpose – The purpose of this paper is to examine empirically the nature of smoothing returns practices in a sample of 79 Islamic banks across 19 countries during the period 2001-2006.

Design/methodology/approach – Previous researchers' methods, based on the variation and determination coefficients, are used in this study to detect the smoothing practices.
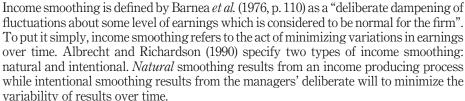
Findings – Results indicate that the revenues from the "*Shariah*-based products" derived from the profit and loss sharing principle show higher variability than the "*Shariah* compliant revenues" and that income from this source is relatively lower. They also show that a large number of Islamic banks engage in natural income smoothing. Based on the determination coefficient results, 70 per cent of banks were found to have less smoothed total revenue than their net income. Results based on variation coefficient further confirm this finding, with 67 banks having a coefficient of total revenue higher than that of the net income.

Practical implications – The results suggest that Islamic banks should strengthen the use of smoothing techniques, such as the profit equalization reserves (PER) and the investment risk reserves (IRR), as they allow them to further stabilize the revenues payout for the investment account holders (IAH) and therefore mitigate withdrawal risk. Standardizing the smoothing techniques could be a solution to overcome the variability of this category of revenue.

Originality/value – This work is the first of its kind for Islamic banks. It extends previous research by examining whether or not managers may smooth their results naturally or intentionally. It also helped to bridge the gap in the literature by providing the empirical evidence on the smoothing returns in Islamic finance.

Keywords Islam, Banks, Income, Income smoothing, Natural smoothing, Intentional smoothing

Paper type Research paper

1. Introduction

Income smoothing is defined by Barnea *et al.* (1976, p. 110) as a "deliberate dampening of fluctuations about some level of earnings which is considered to be normal for the firm". To put it simply, income smoothing refers to the act of minimizing variations in earnings over time. Albrecht and Richardson (1990) specify two types of income smoothing: natural and intentional. *Natural* smoothing results from an income producing process while intentional smoothing results from the managers' deliberate will to minimize the variability of results over time.

Most prior studies on income smoothing were concerned with the issue of measurement and often focused on the non-financial context. More recently, several empirical studies have revealed various smoothing practices in commercial banks especially American banks to identify such practices and the relation between

provisions and net income (Scheiner, 1981; Greenawalt and Sinkey, 1988; Ma, 1988; Anandarajan *et al.*, 2005).

In Islamic financial theory, smoothing of the profit payout to investment account holders (IAH) is a well-acknowledged practice. The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) financial accounting standard (FAS) 11 requires the recognition of the profit equalization reserves (PER) and the investment risk reserves (IRR). These reserves stabilize the returns for Islamic banking institutions and mitigate withdrawal risk. However, empirical studies related to return smoothing practices are limited and report mixed results.

Ismail and Be Lay (2002) found that Malaysian banks use loan loss provisions during the period 1997-1999 to manage their earnings. Zoubi and Al-Khazali (2007) confirm this finding on a sample of 47 conventional and Islamic banks operating in GCC over the period 2002-2003. However, Ismail *et al.* (2005) found that commercial banks in Malaysia, which offered dual products (Islamic and conventional) during the period 1998-2001, did not use loan loss provisions to manage their earnings but instead utilize realized security gains and losses. Ismail and Shahimi (2006) also found evidence that Islamic banks in Malaysia use PER over the period 2002-2004 to smooth their results and then stabilize the returns to IAH. Recently, Taktak *et al.* (2010) found evidence of income smoothing practices for a large sample of Islamic banks across 19 countries from 2001 to 2006 that do not use the loan loss provisions intentionally. Given the divergent findings of previous literature and the diversity of tools suggested for smoothing purposes, it would be interesting to examine empirically the nature of returns smoothing practiced by Islamic banks.

Thus, this paper first seeks to verify if the recognition of the PER and the IRR leads Islamic banks to have the smoothest revenue payout to IAH, as expected. In other words, it examines which category of revenue is smoother. Second, it aims to determine the nature of income smoothing practiced by Islamic banks, thus extending previous research by investigating whether managers smooth their results naturally or intentionally. The answer to that question is fundamental to ascertain if the nature of the Islamic financial products leads to a natural income smoothing or it results from a deliberate intervention by managers.

To achieve this objective, this study replicates Imhoff (1977) and Eckel (1981) approaches based on comparing the variability of net income to that of sales. The results show that the revenues from the "*Shariah*-based products" derived from the profit and loss sharing principle have higher variability than the "*Shariah* compliant revenues". Furthermore, the results reveal that the majority of Islamic banks engage in natural income smoothing. To be precise, on the basis of the determination coefficient, 55 banks out of 79 were found to have less smoothed total revenue compared to the net income. The results derived from the variation coefficient confirm this finding, since 67 banks have a coefficient of total revenue higher than that of the net income.

The rest of the paper is organised as follows. Section 2 provides a background overview on the tools used, naturally or intentionally, by Islamic banks to smooth their returns. Section 3 presents the research method. Section 4 discusses the empirical findings. Finally, Section 5 concludes the paper.

2. Literature review
Islamic banks operate in a unique environment governed by Islamic principles (the *Shariah*) and based on risk sharing between investors. For this reason, they adopt

accounting standards that are different than those applied by conventional banks. For instance, FAS 11 related to provisions and reserves recommends the recognition of a general and a specific provision to maintain an adequate level of provision against assets impairments and credit exposures. It also advocates the recognition of two kinds of reserves, PER and IRR, which are used to reduce the volatility of rates of return on investment deposits.

In this section, we mainly focus on the tools used by managers of Islamic banks to smooth their returns. These techniques are either regulated according to Islamic accounting standards (natural tools) or arise from *Shariah* principles based on the interpretations of the four main Islamic schools of thought (*madhabs*), as well as influenced by the cultural and Islamic values of the managers (Karbhari *et al.*, 2004). In other words, the former is natural smoothing while the latter is artificial or real smoothing. Since the techniques vary from one Islamic S*hariah* Committee to another, Tahir (2004) calls for the development of a *Shariah* manual to harmonize the accounting procedures. A lack of standardization could promote accounting manipulations and management discretions.

The first smoothing technique is derived from the specificities of "The *Shariah*-based products", especially those of *Musharaka* (partnership with capital) and *Mudarabah* (partnership with capital and skill). Since they rely on the principle of sharing both risk and reward, these products motivate managers to smooth the profit payout to IAH. Therefore, Islamic banks would keep an adequate rate of return for their depositors to avoid withdrawal risk (IFSB, 2010). They make reserves from the current total gross income by reducing the reported income when they predict that investors will gain a lower return on their deposits. According to AAOIFI's FAS 12, the returns gained from the "*Shariah*-based products" are not fixed in advance: they depend on the outcome of the project and its loss is to be shared in relation to capital contribution. Income variations from investment and financing could cause an uncompetitive rate of return to depositors. Thus, the PER and IRR are recommended by FAS 11 "to smooth the returns actually paid out to the Profit-Sharing Investment Accounts owned by Investment Account Holders". These reserves are commonly used by Islamic banks to manage earnings and hedge them against future declines in performance. In fact, Sundararajan (2005) found that for Malaysian banks, PER are a determinant of net income before provisions. The IRR are also created to cover an eventual negative asset returns payout to the IAH. These reserves allow them to absorb losses if the benchmark rate goes up. They also prevent Islamic bank customers from switching to conventional banks if the benchmark rate declines (Rosly, 1999). A suitable combination of the PER and the IRR to reach the target return is decided by Islamic bank managers based on their expectations of the way these reserves will be used in the future (Sundararajan, 2005).

Another smoothing technique carried out by Islamic banks consists of using the loan loss provisions advocated by the FAS 11. They have to preserve an adequate level of provisioning against the impairment of assets and exposure problems by recognizing a general and specific provision. The former, which is based on a percentage of the financing portfolio, allows banks to cover eventual losses which are not specifically identified. The latter however, is the amount required to write the assets down to cash equivalent value if this is lower than cost. Empirically, the results about the use of this technique for smoothing purposes are mixed.

The exposure draft on "the practice of smoothing the profits payout to IAH" provides an additional technique consisting of the commingled fund of investors (shareholders and IAH). According to paragraph 23, an Islamic bank transfers profit from current or retained shareholders' profits to IAH for the purpose of increasing their returns. The commingling of funds is in favor of Islamic depositors if shareholders agree to this decision. This motivates Islamic banks to smooth their net income and stabilize the returns payout to IAH.

In addition, Archer and Karim (2006) suggest that Islamic banks can invest a proportion of unremunerated assets whose return is certain but with a lower risk form. This approach allows banks to produce more returns, which favors a stable income and promotes income smoothing practices. As long as the "*Shariah* compliant products"[1] are based on the principle of cost-plus margin, they offer an opportunity for managers to use their latitude, especially in setting the selling price which in turn may affect the gross revenue for Islamic banks.

In short, Islamic banks can adopt various mechanisms to smooth their net income and the revenues paid out to IAH. In fact, they may use their accounting discretion to move their net income closer to the target values and stabilize the rate of return to depositors, meaning they are expected to smooth their results intentionally.

3. Research method
3.1 Data
This study was conducted on a sample of 79 Islamic banks from the international database "Bankscope" across 19 countries[2] during 2001-2006. As suggested by Copeland (1968), a period of four to six years is adequate to minimize classification error. Only banks for which information on net income and revenues are available for three consecutive years are included in the sample. Similarly, to ensure the reliability of data, each Islamic bank selected for the sample is checked against its website. About 70.1 per cent of the banks included in the sample comprised those from Bahrain, UAE, Turkey, Iran, Sudan, Pakistan, Kuwait, Saudi Arabia and Yemen. The sample is representative of the Islamic banking sector because the GCC countries, especially Bahrain, Kuwait and the UAE, capture about 13 per cent of the total assets of the world Islamic banks.

3.2 Detecting smoothing returns methods
To test the nature of smoothing practices across Islamic banks, we use the income variability approach initiated by Imhoff (1977) and further developed by Eckel (1981) (Albrecht and Richardson, 1990; Atik, 2009)[3]. This method measures income smoothing by aggregating the effects of several potential smoothing variables over time instead of being limited to a specific accrual variable (mainly the loan loss provisions for banks)[4]. The latter approach ignores the possibility that bank could manipulate several variables simultaneously, hence may produce biased results. Moreover, the classical approach used in this study is more suitable to detect smoothing practices over short periods as mentioned by Chalayer and Dumontier (1994).

The basic logic of this method is consistent with the idea that "a naturally smooth income stream simply implies that the income generating process inherently produces a smooth income stream" (Eckel, 1981, p. 28). So, firms select their accounting policies in terms of their overall expected effects on net income and not independently

(Zmijewski and Hagerman, 1981). This implies that changes in income are the result of income smoothing practices. Thus, the way to detect intentional smoothing practice is by comparing income variability to sales variability. If the variability of sales is greater than the variability of income, then the firm can be considered to have intentionally smooth its income.

Imhoff (1977) approach is based on the determination coefficient (R^2) which measures the association between income, sales revenue and time. According to this method, an intentional smoothing occurs if one of the two following conditions is met:

(1) There is a weak relationship between sales and the net income.

(2) The net income is smoother than the sales. This is achieved by the separate regression of income and sales revenue over time: Income $= \alpha + \beta$ (time) and Sales revenue $= \alpha + \beta$ (time).

In respect of the first condition, it requires setting a threshold from which the relationship is deemed weak. Accordingly, smoothing is tested solely from the second condition by comparing the R^2 of net income with R^2 of sales revenue. Natural smoothing is evidenced when the sales revenue series is smoother than the net income series, i.e. the R^2 of sales revenue is greater than the R^2 of net income.

The Eckel (1981) method is based on the intuition that sales and earnings are naturally linked. However, to demonstrate that income smoothing is a natural process, Eckel (1981) measures the variability of sales and income using the variation coefficient. The latter is the standard deviation of the changes in the smoothing object (SO) of each bank during the study period divided by the mean of the SO ($CV_{it} = \sigma$ (Δ SO_{it})/m (SO_{it})). This coefficient appreciates the dispersion of a set of results from their average. Eckel (1981, p. 33) proposes:

[...] that (1) income is a linear function of sales: Income $=$ Sales – Variable Costs – Fixed Costs; (2) the ratio of variable costs in dollars to sales in dollars remains constant over time; (3) fixed costs may remain constant or increase from period to period, but may not be reduced; and (4) gross sales can only be intentionally smoothed by real smoothing, that is, gross sales cannot be artificially smoothed.

Similar to Imhoff's method, smoothing is said to be natural when the sales revenue series is smoother than the net income series, i.e. the sales variation coefficient is smaller than that of the net income. If not, the bank is classified as intentionally smoothing its net income.

4. Empirical results

4.1 Revenue structure of Islamic banks

Since the Bankscope database uses a universal definition of the different components of financial statements for both conventional and Islamic banks (Hassan, 2006), the non-interest income coincides with the total operating income. It consists of the "*Shariah* compliant products", which are non profit and loss sharing financing such as *Bai' Muajjal* (deferred payment sale), *Ijarah* (leasing), *Murabahah* (cost-plus financing) and *istisna* (contract manufacturing). On the other hand, interest income is composed of the profit and loss sharing revenues (the *Shariah*-based products) such as *Mudarabah* (profit-sharing) and *Musharakah* (joint venture). According to Turk Ariss (2009), the total revenue for an Islamic bank includes both the interest and non-interest income.

Year	Variables	Mean	Median	Min.	Max.	SD
2001	Non-interest income	31,142.35	5,609	− 5,381	821,755	115,607.2
	Interest income	100,568.7	44,900	− 347	802,323	157,674.7
	Total revenue	146,749.3	53,660.5	970	940,561	228,063.5
	Net income	31,090.73	5,645	− 17,281	411,749	82,252.15
2002	Non-interest income	49,765.42	7,149	0	1,420,058	185,525.8
	Interest income	118,407.1	42,773.5	− 1,753	775,461	191,936.2
	Total revenue	180,205.2	49,761	1,629	1,476,540	299,306
	Net income	34,776.3	7,740	− 32,184	377,356	78,610.47
2003	Non-interest income	49,836.92	7,756	− 8,142	1,578,534	190,832.5
	Interest income	138,159.7	44,383	− 865	944,646	226,719
	Total revenue	198,342.2	55,275	0	1,756,076	340,910.8
	Net income	43,534.88	9,600	− 11,971	544,219	102,326.4
2004	Non-interest income	7,063,301	13,685	− 12,530	2,203,638	254,265.6
	Interest income	173,002.2	61,346	808	1,254,512	291,068.9
	Total revenue	257,918.3	77,488	− 703	2,442,041	453,990.7
	Net income	62,042.55	17,512	− 9,576	783,952	139,313.4
2005	Non-interest income	104,359.1	20,724	− 2,631	2,589,740	324,812.7
	Interest income	247,764.1	73,438	0	1,604,878	391,703
	Total revenue	352,123.2	95,839.5	4,322	3,010,937	590,007.3
	Net income	86,598.34	27,992	− 133,632	1,504,219	201,760.6
2006	Non-interest income	102,693.8	30,551	67	771,599	181,573.7
	Interest income	304,045.5	164,313	1,642	2,044,940	433,367.2
	Total revenue	406,739.2	177,715	1,709	2,761,549	590,998.2
	Net income	158,157.7	52,088	− 352,871	1,949,773	339,237.9

Note: All values are expressed in millions of USD
Source: Bankscope (2008)

Table I.
Descriptive statistics of
the revenue structure of
Islamic banks

Table I presents the revenue structure of the Islamic banks included in the sample. It shows that each revenue component is nearly the same over time. In fact, both the interest and non-interest incomes fluctuated around a steady growth level. This suggests that revenue stability may result from a natural process.

The figures also show that, on average, the non-interest income is significantly lower than the interest income over the study period. This finding reveals, in particular, that the "*Shariah* compliant products" are predominant in the Islamic banks revenues. The profit and loss sharing revenues from *Mudarabah* and *Musharakah* made up only a quarter of the Islamic bank's total sales. Thus, this revenue structure is similar to the one found in Malaysia and Pakistan where credit-based financing (cost-plus sales) is the dominant form. In Pakistan, only 17 per cent of the transactions are compatible with the *Shariah* sharing principle. This rate decreases to 10 per cent in Malaysia (Dar and Presley, 2000).

4.2 Returns smoothing practices
For each bank in the sample, both the variation and determination coefficients have been calculated for every category of revenue as well as the net income. Panel A of Table II reports the variation coefficient measurements. If the bank's coefficient is small and closer to zero, then it is classified as having smoother income. The median values of the variation coefficient related to the interest income have the slightest relative variability

Variables	Mean	Quartile	Median	Min.	Max.	SD
Panel A: coefficient of variation (CV) – first quartile						
CV net income	0.6478	0.3011	0.4912	0.0451	2.4781	0.5316
CV total revenue	0.3284	0.1311	0.2252	0.0359	2.2898	0.3342
CV non-interest revenue	0.6128	0.2784	0.5137	−1.1917	2.9447	0.5280
CV interest income	0.3042	0.1452	0.2213	−1.6413	1.7213	0.3848
Panel B: coefficient of ldetermination (CD) – third quartile						
CD net income	0.6772	0.8944	0.7957	0.0101	0.9994	0.2798
CD total revenue	0.8058	0.9552	0.8823	0.0158	0.9985	0.2365
CD non-interest revenue	0.6811	0.8918	0.7690	0.0090	0.9964	0.2810
CD interest income	0.7984	0.9508	0.8933	0.0038	1.0000	0.2507

Table II.
Descriptive statistics for net income and sales revenue

(22.13 per cent), followed by the variation coefficient of the total revenue (22.52 per cent). This percentage rises to 49.12 per cent for the net income measure. However, the median of the variation coefficient connected with the non-interest revenue is the highest (51.37 per cent), thereby revealing more instability. This variability is derived from the nature of each category of revenue.

Unlike conventional banks, which operate with a fixed rate of return on investment, Islamic banks are managed according to the profit and loss sharing principle whereby investment financing system is expressed in a variable return. This implies that managers should use and ultimately strengthen smoothing tools such as PER and IRR to reduce the variability of the non-interest income and give better rates of payout to IAH. It is an unexpected result because accounting standards require a steady income from the profit and loss sharing revenues, i.e. the *Shariah*-based products. In fact, Paragraph 59 (p. 13) from the exposure draft points out that the PER and IRR practices are not uniform between countries, nor are they common. It states that:

A small number of supervisory authorities have prescribed different smoothing practices in their jurisdictions. Whereas some have required Islamic banks institutions in their jurisdiction to maintain only a PER, others have chosen to maintain only IRR, while still others have allowed both types of reserves to be maintained without making it a requirement.

These findings are confirmed by the coefficient of determination computed for each category of revenues as shown in panel B of Table II. A high value of this coefficient (close to one) reveals that the revenue category depends on the time series, and therefore the bank is classified as being smoother.

4.3 Income smoothing practices
To detect the nature of income smoothing practiced by Islamic banks, the net income after taxes and zakat has been selected as an SO. It is the measure of earnings used by analysts in working out the price earnings ratio (Buckmaster, 2001). Table III provides more detailed results than those reported in Table II by examining the nature of income smoothing practiced by Islamic banks. Panel A represents the results of the classification process undertaken to distinguish between naturally and intentionally

smoothing banks by using the determination coefficient approach. Panel B provides results based on the variation coefficient approach.

Table III highlights the existence of income smoothing practices in Islamic banks which is in line with the findings of Archer and Karim (2006). When R^2 of the total revenue is compared with R^2 of the net income, 55 banks out of 79 (70 per cent) are classified as naturally smoothing and 24 (30 per cent) as intentionally smoothing. On the basis of the variation coefficients as reported in panel B, the number of intentionally smoothing banks decreases to 12 and the naturally smoothing ones increases to 67.

Table IV presents the results of student t-test to determine if there is a significant difference between the net income coefficient and the total revenue coefficient (panels A and B). The results provide evidence that the variation coefficients of the net income are higher than those of the total revenue, and the determination coefficients of the net income are smaller than the total revenue coefficients. This confirms the natural smoothing practices in Islamic banks. These findings are contrary to the income smoothing practiced by conventional banks for which empirical literature has highlighted intentional smoothing (Greenawalt and Sinkey, 1988; Ma, 1988).

The risky environment within which Islamic banks operate, the absence of guaranteed returns or deposit insurance and the nature of the Islamic financial products, all lead them to engage in natural income smoothing. A stable level of income enables them to maintain reserves against losses. In fact, Kim and Santomero (1993, p. 315) specify that "bank earnings are a more meaningful indicator to cover expected losses". Besides, this type of income smoothing could result from the nature of accounting policies adopted by Islamic banks. For example, the dynamic provision policy of FAS 11 helps them to anticipate and cover credit losses, which favors flat earnings and implies a natural smoothing. Furthermore, through the use of PER and IRR, Islamic banks are able

Panel A: determination coefficients (CD)	Number of banks	Panel B: variation coefficients (CV)	Number of banks
R^2 (net income) $< R^2$ total revenue	55	CV (net income) $>$ CV total revenue	67
R^2 (net income) $> R^2$ total revenue	24	CV (net income) $<$ CV total revenue	12
Total	79	Total	79

Note: Decision rule: a bank is classified as naturally smoothing if R^2 (net income) $< R^2$ (total revenue) or CV (net income) $>$ CV (total revenue)

Table III.
Number of banks with a determination coefficient or a variation coefficient of net income higher (or lower) than the coefficient of total revenue

Panel A: differences in means of determination coefficient Mean (%)				Panel B: differences in means of variation coefficient Mean (%)			
R^2 net income	R^2 total revenue	Difference (%)	t-statistic	CV net income	CV total revenue	Difference	t-statistic
67.72	80.58	-12.86	-35.53***	64.78	32.84	-31.94	-38.09***

Note: Decision rule: a bank is classified as naturally smoothing if R^2 (net income) $< R^2$ (total revenue) or CV (net income) $>$ CV (total revenue)

Table IV.
Differences in means of determination and variation coefficients

to maintain a stable income and minimize conflicts between shareholders and IAH. In fact, if IAH are classified as "defensive" investors requiring a steady level of profitability, then shareholders seem to be more "aggressive" since they want to engage in riskier activities leading to higher level of returns (IFSB, 2010). In short, natural income smoothing guarantees a minimum return.

5. Conclusion

The aim of this paper is to test the nature of the smoothing return practices on a sample of 79 Islamic banks over the period 2001-2006. Unlike prior research which focus on management use of loan loss provisions such as PER and IRR to manage their returns, no study has addressed the more fundamental question of whether the smoothing mechanism is natural or intentional. Using the methods of Imhoff (1977) and Eckel (1981), results in this study indicate that revenues from "*Shariah*-based products" based on profit and loss sharing principle are more variable than the "*Shariah* compliant revenues". In addition, results show that a larger number of Islamic banks engage in natural income smoothing. More precisely, in accordance with the determination coefficients, 70 per cent of the banks has total revenue that is less smooth than the net income. The results from the variation coefficient confirm this finding, since 67 banks have a total revenue coefficient higher than that of the net income.

These findings reveal that generally, Islamic banks do not exercise their discretions to smooth their results. Instead, this smoothing originates from a stable and steady activity mainly due to the nature of the Islamic financial products. Also, the fact that the payout revenues to IAH are more variable than others suggest that Islamic banks could strengthen the use of smoothing techniques through the use of PER and the IRR. This implies that the supervisory authority should exert greater control on the accounting practices applied by Islamic banks.

Thus, our conclusions do not provide evidence that Islamic banks resort only to natural income smoothing. Results confirm that a number of banks do indeed use discretions to smooth their results. Further research is therefore needed to confirm our findings. It is also interesting to test the income smoothing hypothesis on a multiple period to detect more earnings management strategy as mentioned by Moses. Furthermore, this study can be extended by comparing income smoothing between conventional and Islamic banks. Finally, the use of threshold studies, as a non-parametric approach based on the measure of irregularities around the zero earning to detect the income smoothing, could confirm our findings.

Notes

1. Tools such as *Murabaha* (cost-plus financing), *Ijara* (leasing), *Bai Salaam* (spot payment for future delivery), *Bai Muajjal* (sale on deferred payment), *Istasna* (advance purchase of goods or buildings) and *Diminishing Musharaka* (housing finance) are the main *Sharia* compliant products resulting from the non-profit sharing financing. We should notice that these products are in line with those offered by conventional banks.

2. The distribution of 79 Islamic banks in 19 countries comprises of Bahrain (11), UAE (11), Turkey (9), Iran (8), Sudan (5), Pakistan (5), Kuwait (4), Arabia Saudi (4), Yemen (4), Malaysia (3), Jordan (3), Bangladesh (2), Brunei (2), Qatar (2), Egypt (2), Russia (1), Indonesia (1), Mauritania (1) and Tunisia (1).

3. See Albrecht and Richardson and Atick for a comprehensive list of studies.

4. We note that another method to detect the nature of income smoothing is by considering the economic sector. It is based on the idea that firms belonging to riskier sector are more encouraged to smooth their results in order to reduce their level of risk. However, this method is not suitable for studying the variability for a single sector.

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