Accounting Exposure Risk Management in the Jordanian Firms An Empirical Study

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ABSTRACT

This study investigated Accounting Exposure Risk Management (AERM) in the Jordanian firms, with special emphasis on exposure through transactions that make them heavily exposed to exchange rate changes through the accounts receivable and accounts payable denominated in foreign currency resulting from exporting and importing.

Based on AE theories, which state that firms with higher linkage with a foreign environment would face higher degree of AE and consequently would hedge more, this study examined this normative theory within the context of Jordanian firms taking into consideration the size and industry effects on the levels of AERM that Jordanian firms use.

Based on a questionnaire survey that was handed to one hundred and fifty four (154) commercial and manufacturing Jordanian firms, the results of the empirical study suggested that Jordanian firms were not heavy users of the AERM instruments, especially the advanced innovations like currency derivatives. The percentages of foreign to total sales and foreign to total debt were significantly correlated with levels of managing accounting exposure. These results were explained as Jordanian firms which have revenues denominated in foreign currency would be able to obtain loans denominated in the same foreign currency which creates natural offsetting between the in and out foreign cash flows.

In addition, while the size seems to have a high effect on the level of managing AE that Jordanian firms use, the sector of the firm revealed insignificant effect on the behaviour of Jordanian firms toward the AE that they face.

In sum, it is possible to conclude that AE theories seem to be somehow applicable in the Jordanian firms. However, they do not provide full explanation about the AERM behaviour, which suggests that there are other factors which play roles in determining the AERM behaviour in the Jordanian firms.

Keywords: Accounting exposure, Translation exposure, Transaction exposure, Hedging, Financial derivatives.

INTRODUCTION

The term "exposure", when used in the context of foreign exchange, refers to "the sensitivity of changes in the real domestic currency value of assets, liabilities, or operating incomes to unanticipated changes in exchange rate" (Levi, 2003: 293). According to this definition, many researchers used a regression coefficient of the real value of the firm on the exchange rate in order to define the Exchange Rate Exposure (ERE) attempting to provide an evidence with regard to the effect of the ERE on the firm's value (Jorion, 1990; Bodnar and Gentry, 1993; Bartov and Bodnar, 1994; Bartov et al., 1996; Chow and Chen, 1998; Shin and Sonen, 1999; Marston, 2001; Williamson, 2001; Chen et al., 2004; Dominguize and Tesar, 2006).

ERE is typically divided into accounting and economic exposure. Accounting exposure, in turn, is divided into translation exposure and transaction exposure.

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Translation exposure arises from the need, for purposes of reporting and consolidation, to adjust the financial statements of the subsidiaries from the foreign currencies involved into the local currency. Shapiro (1999) indicated that this form of exposure results when the individual items in the financial statements of the foreign entity are translated as if all transactions had been entered into by the reporting enterprise itself. Therefore, translation exposure occurs only in the parent corporations' financial statements, while subsidiaries will never experience this form of ERE. This raises the question of whether translation gains or losses should be shown in the balance sheet as an adjustment to the shareholder equity, or should be shown in the income statement as differences in the foreign currencies (Eitteman *et al.*, 2003). Therefore, managing translation exposure is criticized on the basis that it is purely a result of paper gains and losses. For example, Pramborg (2004) examines the value effect from different aspects of hedging activities and foreign operations. The findings from a sample of Swedish firms over the period 1997-2001 suggest that there seems to be a positive value effect from hedging transaction exposure; however, hedging translation exposure does not add value. Nevertheless, the paper gains and losses have an effect on tax payment and consequently on the out cash flow. Therefore, translation exposure still needs to be hedged (Levi, 1996; Shapiro, 1999).

Transaction exposure is concerned with the out and in foreign cash flows as a result of the company's transactions denominated in foreign currencies. Therefore, transaction exposure stems from the possibility of incurring future exchange gains or losses on transactions already entered into and denominated in a foreign currency (Shapiro, 1999: 276). Similar to the other form of AE, a link with the financial statements also remains. If payment on transaction has not yet been made, a foreign currency debt will be documented as a receivable or payable, whereas if payment has occurred, a foreign currency cash balance will have been created prior to the exchange of the corporation's domestic currency. Thereby, transaction exposure that occurs is an exposure to attain an amount of foreign currency payable or receivable, or an exposure to obtain cash balance not converted into the domestic currency, which may take on a different value when converted. Buckley (2000) used contractual exposure as another term to denote transaction exposure. He noted that most commentators define transaction exposure as related to a contract already entered into. With this regard, Choi (2003) emphasized that for a contract, there are "considerations" which must be mentioned by law, which means that the exposure is at least quantified. However, there is no agreement as to whether the amount in foreign currency must be certain before it can be called a transaction exposure.

The second form of ERE is an economic (operating) exposure, which arises because currency fluctuations can modify the company's future revenues and costs (future cash flows) (Shapiro, 1999). Therefore, the expected changes in exchange rates is not included in the definition of operating exposure because both management and the investors should have taken this information into their evaluation of anticipated operating results and market value (Eiteman *et al.*, 2003).

This paper surveys one form of the exchange rate exposure practices in Jordanian non-financial firms, which is Accounting Exposure (AE), with special emphasis on transaction exposure. Examining this form of ERE could be attributed to the following reasons; first, Jordan has an opened economy, as the statistical figures in Jordan for the financial year 2008 show that exports and imports represent 45% and 55% of the GDP, respectively, which makes it an ideal example to test the currency transaction risk management practices in one of the developing countries. Second, translation exposure

should be treated by firms in Jordan according to the instructions of ISA 21. In addition, there is a very limited number of Jordanian firms experiencing this form of exposure, as it exists only in parent companies that have subsidiaries or branches abroad. Third, economic exposure is the most difficult form to be measured or hedged among the forms of foreign currency exposures, (see for example, Eitmman *et al.*, 2003; Shapiro, 1999). Therefore, it should be taken into consideration that risk management is a very new discipline in a country like Jordan and not all the Jordanian managers have enough knowledge concerning measuring or hedging it. Finally, transaction exposure is the simplest type of exposure to measure and to hedge and has a direct influence, making managers seriously think about it even if they don't have enough knowledge.

Accordingly, the main purpose of this research is to increase the understanding of the AERM practices in Jordan and the factors that might affect the degree of AE that a Jordanian firms faces and how to manage it. The aims of this research will be as follows:

- To examine the degree of AE that the commercial and manufacturing Jordanian firms face.
- To investigate the attitude and the reaction of the Jordanian firms toward AE that they face.
- To examine factors that influence the degree of AERM in Jordanian firms.

LITERATURE REVIEW

In the beginning of the 90s, a number of studies attempted to provide discipline with insight in the practice of AERM in the non-financial corporate sectors. These studies were provided from many avenues. For instance, Belk and Glaum (1990) surveyed the seventeen largest manufacturing companies in UK and found that transaction exposure is the main focus of the UK multinational firms, whereas translation exposure captured less attention. Batten *et al.* (1993) surveyed the largest 500 Australian firms in order to examine their reaction toward accounting exposure. The empirical results of their study indicated that transaction exposure is the most relevant one, whereas translation exposure was not important. Fatimi *et al.* (2000) examined the response of the German multinational firms toward accounting exposure and found that 62% of the fimrs hedge their transaction exposure; while only 17% of the respondents actively manage their translation exposure.

Other several studies investigated the determinants of AE and the determinants of AERM. Chow and Chen (1998) examined the AE and its determinants on a sample of 1110 Japanese firms listed on Tokyo Stock Exchange (TSE). Their results indicated that the industry sector, the import ratio, the export ratio and the firm size were the main determinants to the degree of transaction exposure that a firm faces and therefore, firms in trade sectors with higher degree of exports and imports and larger firms have higher likelihood to hedge their TE. Shin and Sonen (1999) examined the degree of AE in a sample of 1051 US multinational firms. Their results showed that smaller firms face higher degree of transaction exposure than translation exposure. More recent studies, such as that of Gonzales et al. (2007) examined also the determinants of accounting exposure and their effect on the degree of risk management in Spanish exporters and importers and found that the main variable that determines the volume of hedging is the level of exchange exposition. With regarding to foreign debt, they found that the companies use it as a complementary hedging instrument. Moreover, its use and quantity are explained by the volume of foreign sales only. Hagelign and Pramborg (2006) investigated the use of financial hedge in Swedish firms against AE. Their survey responses indicated that over 50% of the sampled firms employed financial hedges and that

transaction exposure is more frequently hedged than translation exposure. Brownlee et al. (2008) examined the degree of accounting and economic exposure that US firms face and found that US firms are more likely to hedge accounting exposure than economic exposure.

Many other researches investigated exchange rate exposure from different aspects, such as: (Bodnar *et al.*, 1995; Bodnar *et al.*, 1998, Bodnar and Gebhardt, 1998; Howton and Perfect, 1998; Allayannis and Weston, 2001; Allayannis *et al.*, 2001; Fong, 2001; Hagyline and Pramborg, 2004; Judge, 2006), who investigated the use of currency derivatives by non-financial firms in managing their AE. Their results indicated that transaction exposure is most hedged and that forward contracts are the most common currency derivative use by firms.

A critical review to the AE literature revealed the following important points:

- First, these studies concentrated, however, exclusively on the advanced countries ignoring AE and its hedging in the developing markets with an exception to very few studies, such as the study of Gelso (2003), who examined the use of foreign debt as a hedging instrument for AE. The results of Gelso's study support the theory of AE and provided evidence about the use of foreign debt by Mexican non-financial firms to manage their AE. This study is an attempt to fill this gap, since there is very little evidence about how AERM differs among countries and regions.
- Second, the literature revealed that managing transaction exposure is the main focus of the firms, whereas translation exposure captured much less attention. This could be attributed to the fact that managing this form of currency risks is quite straightforward for the firms because the maturity date, the amount and the currency of the transaction are known to the firm. In this context, Chow *et al.* (1997) emphasized that transaction exposure, especially from commitment such as receivable and payable, is typically considered straight forward to be evaluated and hedged.

Importance of the Study

The importance of this study stems from the fact that Jordan has one of the open developing economies and firms which operate in Jordan are highly imported and exported which makes them heavily exposed to exchange rate changes. This situation should lead Jordanian firms to think seriously about the way of managing and eliminating this risk. In fact, Jordanian firms began to pay attention to the exchange rates issues in the past two decades, especially following their experience in the collapsing of the Jordanian Dinar in 1988 (Central Bank of Jordan Report, 1989). Moreover, the participation of Jordan in the World Trade Agreement (WTO) and the notable increase in the volume of foreign trade in Jordan guide the Jordanian firms to more understanding of their AE (Central Bank of Jordan Report, 2001). Therefore, this study is an attempt to examine the degree of AE that the Jordanian firms face in order to provide evidence about how manufacturing and commercial Jordanian firms deal with it.

Model and Hypotheses Development

The set off point of this study is to determine the degree of AE that Jordanian firms face. Three factors were used to determine the degree of AE; the degree of involvement in the foreign environment, the firm size and the industry sector of firms. The following is an explanation for each of these variables and how they have been discussed and examined in the literature.

Determinants of Accounting Exposure

Many attempts have been made to answer the question of why firms face different magnitudes of accounting exposure. Accounting exposure theories, in this regards, argue that the main factors that might

determine the degree of accounting exposure which a firm faces are: foreign environment, firm size and industry effect.

Foreign Environment

Many researchers argue that firms with higher linkage with a foreign environment are more likely to face a higher degree of accounting exposure (see for example Flood and Lessard, 1986; Jorion, 1990; Williamson, 2001; Doukas *et al.*, 2001). At the empirical side, a massive amount of studies examined the foreign environment as one of the motives of hedging and most of these studies suggest a reliable and positive relationship between the foreign environment and hedging (see for example Howon, 1998l; Allayannis and Ofek, 2001; Judge, 2006; Elliot *et al.*, 2003). Mainly, the percentage of foreign sales to total sales was the proxy for the foreign environment in the previously mentioned studies, and some other studies examined the foreign debt as a proxy for the foreign environment. However, the foreign input was completely ignored in the previous studies. This can be attributed to the following reasons: first; concentrating the researches in the ERE area on the developed countries makes foreign sales more important than foreign inputs because of the tendency of these firms to export more than to import. Consequently, the researches that take the developing countries as case studies should take into account the importance of foreign inputs in addition to foreign outputs. Second; data concerning inputs' figures are usually unpublished and more difficult to be obtained than data concerning outputs' figures. Accordingly, the first hypothesis is concerned with the degree of involvement within the foreign environment as follows:

H1: Firms having a higher involvement within a foreign environment face a higher degree of AE and, therefore, should hedge more.

Firm Size

The results of the empirical studies suggest that larger firms face a higher degree of ERE than small firms. Therefore, these firms should hedge more or at a higher level of management. However, Stulz (1996) argued that larger firms have higher ability to mitigate the effect of ERE, because they have the expertise, the resources and easier access to the financial markets. The empirical prior researches, in general, suggested that larger firms face higher degree of ERE and, therefore, they hedge more (see for example, Chow *et al.*, 1997; Chow and Chen, 1998; Shin and Soenen, 1999). Accordingly, the second hypothesis is concerned with the firm size effect and will be as follows:

H2: Larger firms face a higher degree of AE and, therefore, should hedge more.

The Industry Effect

The accounting exposure theories argue that the magnitude of ERE differs across industries due to different degrees of foreign environment, different costs and different market structures. The results of the empirical studies support this argument and report a significant relationship between the magnitude of ERE that a firm faces and its industry (see for example, Bodnar and Gentry, 1993; Shin and Soenen, 1999; Allayannis and Ihrige, 2000; Kiymaz, 2003). Therefore, the third hypothesis will be related to the industry effect and will be as follows:

H3: Firms in different sectors face different degrees of AE and, therefore, should hedge at different levels of AERM.

The degree of Accounting Exposure Risk Management

The dependent variable is represented by the reaction of the

Jordanian firms toward their AE which reflects the attitude of the managements toward any payable or receivable denominated in foreign currency. This reaction, which reflects the degree of AERM in a firm, was examined by previous research as a dummy variable (i.e., to hedge or not to hedge). However, for the purpose of this research, AERM is divided into four categories according to the risk management techniques that firms might use.

Managing AE was designed to be at four levels as follows; Level-1 represents firms that do nothing to manage their AE, Level-2 represents firms managing AE through the internal hedging techniques, which are employed within a firm or within one group without involving contractual relationship with a third party. These techniques include matching, netting, leading and lagging, re-invoicing, pricing and currency basket. Level-3 represents firms that use money market instruments such as short-term deposit and short-term borrowing to manage their AE. Level-4 represents firms that use sophisticated financial hedging instruments such as currency forward, future, options and currency swap.

RESEARCH METHODOLOGY

Data and Sample

In common with several previous studies, this paper empirically investigated the AERM practices using a sample of large firms (see for example, Batten et al., 1993; Judge, 2006). The sample is constructed from the largest 200 manufacturing and commercial Jordanian corporations which have minimum annual sales of five million Jordanian Dinar. The firms were selected among the commercial and manufacturing firms irrespective of whether these firms are listed in Amman Stock Exchange (ASE) or not. These firms have been chosen by checking the largest one hundred firms listed in Amman Chamber of Commerce and a similar number of firms listed in Amman Chamber of Industry. Most of the previous studies used a questionnaire sent to firms (treasury officials) to obtain information on hedging activities. However, due to the nature of the research population, the personal administration approach was the most appropriate one for this research, as a postal questionnaire was an uncommon method in Jordan, where people ignore it most of the time and due to the inefficiency of the Jordanian post. Therefore, it was a crucial step to establish a key person in each company, through friends, relatives and business relationships, in order to be able to get access and meet the required persons. This step was time and cost consuming making it very difficult to meet the targeted persons in two hundred firms. Therefore, one hundred and fifty-eight Jordanian manufacturing and commercial firms have been conducted personally between January and April 2008. A total of one hundred and fifty four (154) firms accepted to respond and completed the questionnaire survey, representing (74%) as a responding rate of the conducted sample. Table (1) illustrates the details and the analysis of the research sample and the percentage of respondents from the commercial and manufacturing companies.

Table (1): Population and response rate.

Sector	Total population	Respondents	Non-respondents	Response rate
Commercial Companies	100	62	38	62%
Manufacturing Companies	100	92	8	92%
Total	200	154 (74%)	46 (26%)	100%

The questionnaire was pre-tested through a pilot study which was conducted with a random sample of twenty firms. A draft questionnaire was used with a semi-structured list of questions that allowed managers to raise any matters they believed to be relevant; thus making it easy to refine the final questionnaire. This step aimed at minimizing the risk of misunderstanding between the researcher and the respondent and helping ensure the appropriateness of questions for the final questionnaire; in particular, whether they reflect all the uncovered issues at this stage.

The final draft of the questionnaire was designed based on an ordinal scale employed through a five point Likert scale and the questionnaire included three sections and a covering letter. Broadly, the first section was concerned with general information about the firm and the respondent, the second section was concerned with financial information such as foreign sales, purchases, debts and assets' volume and the third section was concerned with the hedging techniques that Jordanian firms use to manage their AE.

Reliability of Measurements

The assessment of external reliability is usually done by administrating a test in two stages to the same group of subjects, as *test-retest* reliability is being examined. The problem here is that the intervening events between the test and re-test may account for any discrepancy between the two sets of results. However, this problem may be valid in some cases like examining the job satisfaction among a sample of employees, but examining management policies such as AERM is not expected to be changed in the short run. Also, if the test-retest processes are too close in time, the respondent may recollect or remember the earlier answers (Cramer, 1998; De Vaus, 1996).

Internal reliability is concerned with whether each scale is measuring a single item, making the scale internally consistent (Cramer, 1998). Cronbach's alpha measurement of internal consistency is a well-known statistical test used to examine the reliability of the research measurements. This test is an estimation of the total variance that is not due to error (Oppenheim, 1992). However, this test and the other statistical tests of measuring internal reliability are only applied to measure the reliability of scales where we have a set of questions to measure one concept rather than single item indicators (De Vaus, 1996). Therefore, the nature of data of this research indicates that these tests are invalid to measure the reliability of the research measurements.

In this case, De Vaus (1996: 54) suggests that "the best way to create reliable indicators is to use multiple-item indicators". Therefore, using multiple indicators as proxies to each variable was the best way to increase the reliability of measurements. For example, two variables to measure the firm's size, three variables to measure the foreign environment and two variables to examine the industry effect are used.

DATA ANALYSIS

1. The Dependent Variable

Jordanian firms were asked first to indicate whether they manage their AE, in order to determine the percentage of firms that manage their AE at level-1, which represents the weakest reaction. Table (2) classified Jordanian firms into hedgers and non-hedgers of AE.

Table (2): The distribution of Jordanian firms according to their reaction toward AE.

Response	Yes	No	Total
Managing AE	**91**	**63**	**154**
Percentage	**59%**	**41%**	**100%**

Table (2) revealed that 63 firms (41%) do not hedge their AE and, therefore, they are classified at level-1 of AERM. The rest of the Jordanian firms (59%) indicated

that they manage their AE using different ranges of currency hedging tools. Firms that manage their AE were asked to rank their priorities of using a range of various hedging techniques in a five-point scale. Table (3) represents the use of hedging techniques by the Jordanian firms.

Table (3): The use of hedging techniques by the Jordanian firms.

Instruments	Always	Usually	Sometimes	Seldom	Never	N	Mean Rank
Forward	6	12	3	2	68	91	5.96
Future	-	2	6	8	75	91	4.90
Options	-	2	5	4	80	91	4.93
Swap	-	-	5	3	83	91	4.87
Short-term borrowing	8	14	4	1	64	91	6.55
Short-term deposit	6	12	6	1	66	91	6.31
Netting	13	8	5	-	65	91	6.22
Leading and lagging	22	13	3	2	51	91	6.65
Matching	17	23	1	-	50	91	6.59
Currency basket	32	7	2	1	50	91	6.61
Pricing	12	8	5	3	66	91	5.92

Note: the mean rank is generated by the Friedman two-way analysis of variance by ranks. The Chi-Square statistic is 164.940, significant at 0.001.

Jordanian firms indicated the internal hedging techniques as the most common hedging instruments, followed by money market hedging techniques and finally by currency derivatives. These results are consistent with results of similar researches conducted in developing countries, such as: Cheung et al. (2007) who found that Chinese firms rely heavily on invoicing techniques and Bernard (2008) who found that internal hedging techniques are the most common among the Chinese exporters. These techniques, as explained in the research model, were divided on a four-level scale; level one represents firms that do not manage their AE, level two represents firms that use internal hedging techniques, level three consists of firms that use money market hedging techniques and finally level

four represents firms that hedge at a sophisticated level and use currency derivatives. The distribution of the Jordanian firms according to these levels of managing AE is illustrated in Table (4).

Table (4): The distribution of the Jordanian firms according to their levels of AERM.

	AERM				Total
	Level-1	Level-2	Level-3	Level-4	
Number of firms	63	41	27	23	154
Percentage	41%	27%	17%	15%	100%

Table (4) revealed that sixty three firms or (41%) of the non-financial Jordanian firms do not manage their AE and 41 firms (27%) manage their AE at level (2), which means that they use internal hedging techniques. Moreover, 27 Jordanian firms (17%) use money market hedging techniques or manage their AE at the third level and finally 23 firms (15%) use currency derivatives and therefore are classified at the fourth level of hedging.

2. The Independent Variables

Foreign Environment

Three variables were employed as proxies to examine the degree of involvement within the foreign environment; the percentage of foreign sales to total sales, the percentage of foreign purchases to total purchases and the percentage of foreign debt to total debt. In order to examine these variables, Jordanian firms were asked to rank their percentage of these three variables from 0% to 100%. Then, firms were classified into four categories according to these variables (i.e., no foreign sales, low foreign sales, medium foreign sales and high foreign sales… and so on for each variable). Table (5) shows the distribution of the Jordanian firms regarding these variables.

Table (5): The distribution of the firms according to their percentage of foreign to total sales, foreign to total purchases and foreign to total debt.

	High	Medium	Low	No	Total
Foreign Sales	40	34	26	54	154
Foreign Purchases	119	19	12	4	154
Foreign Debt	10	31	22	91	154

Table (5) shows that there are 40 firms (26%) that have high foreign sales or over 70% of their sales are denominated in foreign currency, 34 firms (22%) that have medium foreign sales or between (40%) and (69%) of their foreign sales are denominated in foreign currency, 26 firms (17%) that have low foreign sales or less than 40% of their sales are denominated in foreign currency and 54 firms (35%) that have no foreign sales. The figures also show that one hundred and nineteen firms (77%) have high foreign purchases (i.e., more than 70% of their inputs are denominated in foreign currency), nineteen firms (12%) have medium foreign inputs, twelve firms (8%) have low foreign purchases and only four firms (3%) do not import from abroad. The majority of the Jordanian firms (59%) have no foreign debt, (14%) have less than 40% of their debt

denominated in foreign currency, (20%) have about half of their debt denominated in foreign currency and the rest of the firms (7%) have more than 70% of their debt denominated in foreign currency.

These findings reveal how much the Jordanian firms rely on purchasing their inputs from abroad and illustrate the high degree of AE, which the Jordanian firms face due of their high international trade.

Firm Size

Two variables were employed to examine the effect of the firm size on managing AE in the Jordanian firms. These variables are The Market Value of Total Assets (MVTA) and the Annual Sales (AS). In order to examine these variables, Jordanian firms were asked to rank their annual sales and their MVTA from zero to 100%. After that firms were classified into three categories (i.e., 0-30%: small firms, 40%-70%: medium firms and more than 70%: large firms). MVTA was used widely by prior research as proxy for firm size (see for example, Nance *et al.*, 1993; Mian, 1996; Geczy *et al.*, 1997; Allayannis and Weston, 2001; Haglien, 2003). However, some other studies used (AS) as a proxy for firm size (see for example, Fatimi and Glaum, 2000; Allayannis and Ofek, 2001). Both variables (i.e., MVTA and AS) were used in this research as proxies for the firm size. In order to examine these two variables, Jordanian firms were classified into three categories; large, medium and small firms. Table (6) depicts the distribution of Jordanian firms according to their size.

Table (6): Distribution of Jordanian firms according to their size.

	Large	**Medium**	**Small**	**Total**
MVTA	14	40	100	154
Annual Sales	27	45	82	154

Table (6) shows that the majority of the Jordanian firms are small based on the two used proxies. Using the MVTA shows that almost two thirds of the Jordanian firms (65%) are small, 26% of them are medium and the rest (9%) are large firms. According to their annual sales, the figures show that about a half of the firms (53%) are small, 29% of them have a medium size and 18% of them are considered large firms.

Industry Effect

Firms from different sectors are expected to face different magnitudes of AE due to different cost structures, different degrees of imports and exports and different currencies use (Flood and Lessard, 1986). Theories of AE argue that industries with greater reliance on foreign inputs and which sell in competitive global markets will face greater AE and, therefore, would make greater use of financial hedging techniques. Accordingly, it is hypothesized that there are significant differences across firms from different industries in their use of financial hedging instruments. The selected Jordanian firms span eight different economic sectors of economy as appears in Figure (1). The Figure shows that the industry most represented in the sample is the mining industry (26%), followed by pharmaceutical industry (19%), food industry (17%) and car industry (15%).

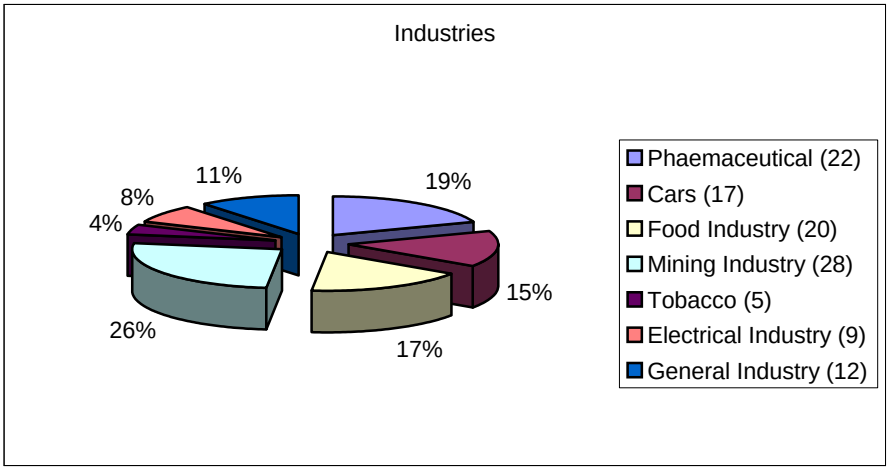

Figure (1): Jordanian firms' distribution according to their industries.

Statistical Results

As indicated, two statistical tests were employed in order to examine the research hypotheses. Mainly, Kruskal- Wallis one- way analysis of variance was used, which examines whether there are statistical differences between different groups in their levels of hedging. The second statistical test was Spearman Correlation, which examines the association between the independent variables (i.e., foreign environment, firm size and industry effect) and the dependent variable (i.e., the levels of AERM).

1. Hypothesis (1): Firms with a higher degree of involvement in the foreign environment face higher degree of AE and, therefore, would manage their exposure at a higher level.

The results shown in Table (7) indicate that the percentage of foreign to total debt and the percentage of foreign to total sales were significantly correlated with the AERM levels and, surprisingly, the percentage of foreign to total purchases revealed insignificant association with the AERM levels. The results of the variance test (Kruskal-Wallis) also revealed that firms with different levels of foreign sales and foreign debt manage their AE at different levels as Chi-Squares were 13.150 and 18.488 at 0.005 and 0.000 levels of significance, respectively. These results could be interpreted as follows; Jordanian firms which have revenues denominated in foreign currency had easier access to the financial markets and intermediaries and were able to obtain loans denominated in foreign currency. This created a natural hedging between the in and out foreign cash flows. In addition, Jordanian firms which have revenues denominated in foreign currencies are more likely to be the manufacturing firms (i.e., the exporters) and most of these firms import their inputs and export their outputs, which might create another natural offsetting between the in and out foreign cash flows. These two reasons might explain the high correlation between these two variables and the degree of AERM. However, Jordanian firms that have expenses denominated in foreign currencies (i.e., the importers) face more obstacles to get access to the financial markets and usually face a naked position, as they have only cash outflow denominated in foreign currency, which cannot help them have a natural offsetting similar to the manufacturing firms.

Table (7): The association between the degree of involvement in the foreign environment and the AERM level.

	Spearman Correlation Coefficient		**Kruskal-Wallis One-Way Analysis of Variance**	
	Coefficient	Significance	Chi-Square	Significance
Foreign sales	0.228*	0.035	13.150**	0.005
Foreign purchases	0.089	0.327	2.869	0.412
Foreign debt	0.335**	0.00	18.488**	0.00

* Significant at 0.05.

** Significant at 0.01.

Note: The analysis included 154 firms in each category.

These results are consistent with those reported in similar previous studies. Kedia and Mozembar (2002) found evidence from US firms supporting the use of foreign debt as a hedging instrument. Also, Eliott et al. (2003) found evidence about the use of debt denominated in foreign currency as a substitution for the use of currency derivatives in managing AE. More recent studies also found similar results, as Gonzales et al. (2007) obtained evidence from Spanish exporters and importers supporting the degree of involvement in foreign environment on the degree of hedging. Regarding foreign debt, they found that companies use it as a complementary hedging instrument and its use and quantity are explained by the volume of foreign sales only and these results are very similar to the results of this study.

Hypothesis (2): Larger firms face a higher degree of AE and, therefore, would use higher levels of AERM.

The statistical results of firm size variables, which are shown in Table (7), revealed significant association between the firm size measured by both variables and the AERM level. Sales volume reported stronger association at 1% level of significance and this result may support our previous interpretation, as firms with a higher percentage of foreign sales have a higher likelihood to manage their AE at a higher level. In addition, this result supports the theoretical argument, which states that larger firms have higher capabilities to use more sophisticated hedging techniques, as they have the capabilities, the expertise and the resources available for the efficient use of financial hedging techniques.

Table (8): The association between AERM level and firm size.

	Spearman Correlation Coefficient		**Kruskal-Wallis One-Way Analysis of Variance**	
	Coefficient	Significance	Chi-Square	Significance
Market Value of T.A.	0.238**	0.008	7.162	0.067
Annual Sales	0.343**	0.000	14.608**	0.002

* Significant at 0.05.

** Significant at 0.01.

Note: The analysis included 154 firms in each category.

These results are consistent with those reported by prior research. For example, Haglien and Pramborg (2006) found that the likelihood of using financial hedging techniques increases with firm size and degree of AE.

Hypothesis (3): Firms which operate in different industries would face different levels of AE and, therefore, would use different levels of AERM.

As indicated, the sampled Jordanian firms span different eight sectors of economy and the findings of the statistical test, which are shown in Table (9), report no statistical differences in the AERM levels across different industries. This result is not surprising, although it seems to contradict with previously reported results, due to incorporation of both manufacturing and commercial firms in the same category, such as pharmaceutical, food and cigarettes' industries. Commercial and manufacturing firms, as was explained, have different characteristics in terms of size and degree of involvement in the foreign environment and, therefore, when the category includes both types, it is expected to reveal no differences in the degree of AERM levels.

Table (9): The association between the sector of the industry and the AERM level.

Industry Effect	Spearman Correlation Coefficient		Kruskal-Wallis One-Way Analysis of Variance	
	Coefficient	Significance	Chi-Square	Significance
AERM levels	0.055	0.549	1.435	0.697

* Significant at 0.05.

** Significant at 0.01.

Note: The analysis included 154 firms in each category.

As previously indicated, commercial firms in Jordan rely heavily on importing finished goods from abroad and selling them in the local market, whereas manufacturing firms import most of their raw materials from abroad and sell their final products to many countries, especially neighboring countries like Iraq and Gulf countries. Therefore, commercial firms will face a "naked position" of AE caused by their greater reliance on foreign inputs, whereas manufacturing firms will face AE resulting from their imports of raw materials and their exports of final products. Consequently, it is more suitable, in the context of the Jordanian firms, to examine AE across commercial and industrial firms rather than across different industries. Therefore, based on this theoretical debate, it is hypothesized that manufacturing Jordanian firms face a higher magnitude of AE and, thereby, will manage it at a higher level of AERM.

The results reported in Table (10) reveal insignificant differences between commercial and manufacturing Jordanian firms concerning their AERM levels at the 5% level of significance and reveal significant differences at the 10% level.

Table (10): The association between the type of firms and the AERM level.

Industry Effect (commercial and manufacturing)	Spearman Correlation Coefficient		Kruskal-Wallis One-Way Analysis of Variance	
	Coefficient	Significance	Chi-Square	Significance
Financial Hedge	0.138	0.130	7.362	0.061

* Significant at 0.05.

** Significant at 0.01.

Note: The analysis included 154 firms in each category.

The results of the first test are different from those reported by the prior research. For example, (Batten *et al.*, 1993; Dole, 1993; Chow and Chin, 1997; Allayannis and Weston, 2001; Doukas *et al.*, 2003) all reported significant differences in the use of financial hedging techniques between different industries.

Conclusions and Implications

This research expands previous studies of AERM and presents one of the first empirical evidences on the attitude of Jordanian firms toward AE. Previous studies within the area of AERM concentrated exclusively on advanced countries, which was highly motivating to provide evidence about how AERM practices differ among countries and regions.

Based on a questionnaire survey handed to one hundred and fifty four (154) financial and general managers of the largest commercial and manufacturing Jordanian companies, the results suggested that Jordanian firms with higher involvement in foreign environment are highly exposed to AE and that Jordanian firms, in general, do not hedge their AE as a response to the degree of AE that they face.

Three factors were examined within the context of AERM; namely the degree of involvement in foreign environment, firm size and industry effect. The results of statistical tests indicated a significant and positive relation between the percentages of foreign to total sales and foreign to total debt with the degree of AERM but not between foreign to total purchases and the degree of AERM. Although this result supported, to some extent, the first hypothesis, the total evidence could not suggest that firms with higher linkage with foreign environment would hedge more because importer firms face a higher degree of AE than exporter firms due to their naked position although the percentage of foreign to total purchases reported no effect. These results could be attributed mainly to two explanations; first, firms with higher revenues denominated in foreign currency (i.e., higher foreign sales) have more ability to mitigate the structural barriers of commercial banks and attain debt denominated in foreign currency, as most of firms indicated. This would create a natural offsetting between in and out foreign cash flows and would, also, raise the question of whether Jordanian firms are aware of their AE and acquire loans denominated in foreign currency for hedging purposes or are attracted by lower interest rates attached to debt denominated in $US. Second, a deeper look into the entire analysis would recognize broader interrelationships between firm size, industry sector and foreign to total sales as the matrix correlation indicated. The analysis at the industry level revealed significant positive relationship between manufacturing firms and the degree of AERM. Jordanian manufacturing firms, in general, are larger than commercial firms and have significantly higher levels of foreign sales. These

findings could lead to the argument which was provided by Stulz (1996) concerning the firm size effect, as he argued that larger firms have a large number of transactions, use many different currencies and work in many different markets with different structures and, therefore, larger firms face a higher magnitude of Exchange Rate Exposure (ERE). On the other hand, large firms have the capabilities, the expertise and the resources available for the efficient use of both financial and operational hedging techniques. They do not face the structural barriers that prevent them from using external hedging techniques and they may obtain better rates for over-the-counter contracts from financial institutions because of larger dealing and, thereby, *ceteris paribus*, the degree of ERE should decrease with firm size. It is obvious that the conflict between these arguments is concerned with the degree of ERE ex-ante and ex-post of hedging.

Accordingly, the overall evidence of this research suggested that AE theory applied partially within the context of Jordanian firms, as the results could not support the normative AERM theories which state that firms facing a higher degree of AE should hedge at a higher level, because the entire evidence could not determine whether the majority of Jordanian firms engaged in hedging techniques are aware of the degree of AE that they face or for other purposes such as acquiring lower interest rates in debt denominated in foreign currency or internal hedging techniques are just there due to the natural offsetting between the in and out cash flows denominated in similar foreign currency.

This study provided important implications for policy makers who seek to understand the link between the degree of AE and the suitable hedging techniques. The study concluded that the existence of in and out foreign cash flows might create a natural offsetting which provides firms with partial protection. However, on the long run, policy makers need to understand and be aware of the degree of AE in order to engage in adequate hedging techniques. Therefore, it is highly recommended that managers should take the AERM matters as one of their priorities due to the high magnitude of AE that they face and provide their employees with sufficient training and experience which they need in this field.

In addition, the results of the study concluded that firms that do not face structural barriers and have an easy access to financial markets managed their AE at higher levels. This result could provide an important implication for the financial authorities, especially the ASE, in order to make attempts in providing Jordanian firms with financial instruments that help them achieve their risk management policies.

Limitations and Suggestions for Further Studies

The data of this research was gathered from questionnaires, which were handed to the managers of each firm. The interpretations of the results of the questionnaire survey are subject to limitations imposed by the research methods used. One problem with costing and timing is that handing the questionnaires by the researcher necessitated a visit to each company to meet the person in question, which was time consuming and expensive, especially since the survey covered a very large area in Jordan to meet the objectives of the study. In addition, the needs for a contact person in each company made the task more difficult. Therefore, many avenues are open for further research.

There is a considerable motivation to recognize the practices of the AERM as a part of an integrated risk management framework. It is useful to learn how a firm can deal with the financial risks as a whole or also with the business risk, in order to explore in which of these risks the firm pays more attention.

Another avenue for further research is to examine the AERM practices and techniques employed within the financial firms. It would be interesting to learn how financial institutions obtain sophisticated managerial skills needed to compete effectively in an increasingly deregulated environment.

Furthermore, it is very useful to examine the AERM in other developing countries in order to gain more insight into the AERM practices within the context of the developing countries. Also, examining the AERM in other developing countries might give an opportunity to integrate translation exposure with transaction, as the absence of the parent companies hinder the investigation of this form within the Jordanian case study.

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إدارة مخاطر الانكشاف المحاسبي في الشركات الأردنية: دراسة إمبريقية

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ملخـص

تناقش هذه الدراسة إدارة مخاطر الانكشاف المحاسبي في الشركات الأردنية، مع التركيز على الانكشاف الذي ينشأ عن المعاملات، و الذي يجعل الشركات معرضة لتقلبات أسعار الصرف من خلال المدينين والدائنين التجاريين بالعملات الأجنبية نتيجة لعمليات الاستيراد و التصدير.

بناء على نظريات الانكشاف المحاسبي التي تشير إلى أن الشركات التي لها ارتباط أعلى مع البيئة الأجنبية تواجه درجة أعلى من مخاطر الانكشاف المحاسبي مما يجعلها تتحوط أكثر، اختبرت الدراسة هذه النظرية في نطاق بيئة الشركات الأردنية، مع اخذ أثر كل من حجم الشركة و القطاع الذي تنتمي إليه بعين الاعتبار كعوامل قد تكون مؤثرة في درجة تحوط الشركات ضد مخاطر الانكشاف المحاسبي.

اعتمادا على دراسة مسحية من خلال توزيع مئة و أربع و خمسين استبانة على الشركات التجارية و الصناعية الأردنية، توصلت الدراسة إلى النتائج التالية. أولا: الشركات الأردنية لا تعتبر من الشركات التي تستخدم أدوات التحوط بشكل كبير و خصوصا بالنسبة للأدوات المتقدمة مثل المشتقات المالية. ثانيا: تبين أن نسبة المبيعات الأجنبية إلى إجمالي المبيعات و الديون الأجنبية إلى إجمالي الديون تؤثر بشكل كبير في درجة التحوط التي تستخدمها الشركات الأردنية. و هذه النتائج تم تفسيرها من خلال ما أوضحه المستجيبون من أن البنوك الأردنية تمنح قروضاً بالعملات الأجنبية للشركات التي لديها إيرادات بالعملة الأجنبية مما يساعد في خلق تحوط طبيعي من خلال التقاص بين إيرادات الشركات و دفعات القروض. بالإضافة إلى ذلك، تبين أن حجم الشركة له أثر هام في درجة التحوط بمتغيريه: حجم الأصول و حجم المبيعات الكلية. إلا أن القطاع الذي تنتمي إليه الشركة لم يظهر أي أثر في درجة التحوط.

بناء على هذه النتائج من الممكن القول إن نظريات إدارة مخاطر أسعار الصرف تنطبق على الشركات الأردنية إلى حد ما، إلا أنها لا تعطي تفسيرا كاملا لسلوك المدراء تجاه هذه المخاطر، مما يشير إلى وجود متغيرات أخرى لها دور في عمليات إدارة أسعار الصرف.

الكلمات الدالة: التحوط، الانكشاف المحاسبي، انكشاف المعاملات، انكشاف الترجمة، مشتقات مالية.

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