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Analysis the Relationship between Working Capital Policy and Operating Risk: An Empirical Study on Jordanian Industrial Companies

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ABSTRACT:

The study aims to investigate the relationship between the aggressive/conservative working capital policies for 59 industrial companies listed at the Amman Stock Exchange for a period of 2004-2007. The impact of aggressive/conservative working capital investment and financing policies has been examined through cross-sectional regression models between working capital policies and profitability as well as the risk of the firms. Efficient management of working capital is a fundamental part of the overall corporate strategy to create the shareholders' value. Firms try to keep an optimal level of working capital that maximizes their value. The optimal level of working capital is determined to a large extent by the methods adopted for the management of current assets and liabilities. It requires continuous monitoring to maintain proper level in various components of working capital i.e. cash receivables, inventory and payables etc. The result indicates a negative relationship between the profitability measures of firms and degree of aggressiveness of working capital investment and financing policy. Moreover, the present study validates the findings of Carpenter and Johnson (1983) that there is no relationship between the level of current assets and liabilities and the risk of the firms

Key words: : Degree of aggressiveness/conservativeness, Working capital policies, Tobin's q, Operating risk and Financial risk

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المخلص:

"تحليل العلاقة بين سياسة رأس المال العامل والمخاطر التشغيلية : دراسة تطبيقية في الشركات الصناعية الاردنية" تهدف هذه الدراسة من التحقق للعلاقة بين العدوانية / المحافظة في سياسات راس المال العامل للشركات الصناعية المدرجة في بورصة عمان وذلك 59 للفترة مابين 2004 ولغاية 2007 . حيث تم اختبار أثر العدوانية / المحافظة في رأس المال العامل كسياسات استثمار وتمويل عن طريق نماذج الانحدار بين السياسات رأس المال العامل والربحية وتبعاً لمخاطر للشركات.

حيث ان الإدارة الفعالة لرأس المال العامل هو جزء أساسي من الاستراتيجية العامة للشركة لخلق قيمة للمساهمين وبالتالي تسعى الشركات في محاولة للحفاظ على المستوى الأمثل لرأس المال العامل والذي يزيد من قيمتها. كما أن المستوى الأمثل لرأس المال العامل يتحدد إلى حد كبير وفقاً للأساليب المعتمدة لإدارة الأصول والخصوم الحالية. ويتطلب الرصد المستمر للحفاظ على مستوى مناسب في مختلف مكونات رأس المال العامل أي المستحقات النقدية والمخزون والذمم الدائنة وما إلى ذلك.

تضمنت النتائج وجود علاقة سلبية بين مقاييس ربحية الشركات ودرجة العدوانية / المحافظة كسياسة استثمار وتمويل في رأس المال العامل. وعلاوة على ذلك ، فإن الدراسة الحالية تؤكد صحة النتائج التي توصلت إليها (Carpenter and Johnson 1983) أنه لا توجد علاقة بين مستوى الأصول والخصوم الحالية ومخاطر الشركات.

الكلمات الداله : درجة الهجومية (العدوانية) / التحفظ ، سياسات رأس المال العامل ، معيار (Tobin's q) ، المخاطر التشغيلية والمخاطر المالية

OPERATIONAL DEFINITIONS (KEY WORDS)

Degree of aggressiveness/conservativeness: the Aggressive Adaptive-Risk (AAR) approach is an efficient adaptive approach for parallel simulation which provides optimistic logical processes with the ability to adjust their degree of risk at run time, based on observed behavior. The AAR approach is implemented on a network of workstations. Performance results using large synthetic loads are reported and compared to those obtained for the Time Warp optimistic technique. This conservative stabilization concept is the result of im-

posing an additional condition to a set of necessary and sufficient conditions for output static stabilization. This paper is devoted to exhaustively study the introduced new stabilization concept: (I) It is shown that for a particular class of plants, the stabilization problem in the above sense can be cast as a convex programming problem. (II) A full characterization of the class of plants that are stabilizable in the above new sense is presented.

Working capital policies: Working capital, also known as net working capital,

is a measurement of a business's current assets, after subtracting its short-term liabilities, typically short term. Sometimes referred to as operating capital, it is a valuation of the assets that a business or organization has available to manage and build the business. Generally speaking, companies with higher amounts of working capital are better positioned for success because they have the liquid assets that are essential to expand their business operations when required.

Tobin's q: Economics theory of investment behavior where 'q' represents the ratio of the market value of a firm's existing shares (share capital) to the replacement cost of the firm's physical assets (thus, replacement cost of the share capital). It states that if q (representing equilibrium) is greater than one ($q > 1$), additional investment in the firm would make sense because the profits generated would exceed the cost of firm's assets. If (q) is less than one ($q < 1$), the firm would be better off selling its assets instead of trying to put them to use. The ideal state is where q is approximately equal to one denoting that the firm is in equilibrium. Also called general equilibrium theory or 'q' theory, it was proposed by the US Nobel laureate economist James Tobin 1918.

Operating risk: the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. The definition includes legal risk, which is the risk of loss resulting from failure to comply with laws as well as prudent ethical standards and contractual obligations. It also

includes the exposure to litigation from all aspects of an institution's activities. The definition does not include strategic or reputation risks.

Financial risk: Probability of loss inherent in the methods used in financing a firm, that may impair its ability to provide adequate return.

INTRODUCTION:

Working capital exists because of market imperfections occurring over firms' operating cycles. To maintain day-to-day operations while accommodating these imperfections, firms choose the pattern and weights of short term asset and liability accounts according to their operating environments and financing abilities. Operating components of working capital are targeted as vehicles for improving cash flow and maximizing shareholder wealth.

Despite the attention paid to short term assets and liabilities typified by these studies, an examination of the motives behind operating working capital strategy, while accounting for the net influence of receivables, inventory, and payables, is absent from the finance literature. There are aggregative studies of working capital components: Shin and Soenen (1998) and Deloof (2003) show profitability and risk-adjusted returns are inversely related to the cash conversion cycle suggesting that aggressive working capital policies significantly improve a firm's performance.

The net investment that supports firm's operations is the working capital

requirement, or net operating working capital, defined as the sum of accounts receivable and inventories net of accounts payable. Operating assets and liabilities ultimately must be managed in concert rather than individually, a condition this paper attempts to reflect.

Net operating working capital relates to free cash flow and in turn market value of equity. A positive working capital requirement, or conservative working capital policy, indicates a need for additional capital which firms can finance internally, reducing free cash flow, or externally, generally via a commercial paper or lines of credit. Thus, conservative working capital policies imply costs of either lost opportunities or explicit financing costs. A negative working capital gap means that the firm's net operating working capital provides financing for long-term assets, implying an aggressive strategy

In general, working capital management is simple and a straightforward concept of ensuring the ability of the organization to fund the difference between the short term assets and short term liabilities (Harris 2005). In practice, working capital management has become one of the most important issues in the organizations where many financial executives are struggling to identify the basic working capital drivers and the appropriate level of working capital (Lamberson 1995). Consequently, companies can minimize risk and improve the overall performance by understanding the role and drivers of working capital.

A firm may adopt an aggressive working capital management policy with a low level of current assets as percentage of total assets or it may also be used for the financing decisions of the firm in the form of high level of current liabilities as percentage of total liabilities. Excessive levels of current assets may have a negative effect on the firm's profitability whereas a low level of current assets may lead to lower level of liquidity and stock outs resulting in difficulties in maintaining smooth operations (Van Horne and Wachowicz 2004).

STATEMENT OF THE PROBLEM

The corporate finance literature has traditionally focused on the study of long-term financial decisions, particularly investments, capital structure, dividends and company valuation decisions. However, short-term assets and liabilities are important components of total assets and need to be carefully analyzed. Management of these short-term assets and liabilities warrants a careful investigation since the working capital management plays an important role for the firm's profitability and risk as well as its value.

The optimal level of working capital is determined to a large extent by the methods adopted for the management of current assets and liabilities. It requires continuous monitoring to maintain a proper level in the various components of working capital i.e. cash receivables, inventory and payables etc.

The present study investigates the relative relationship between the aggressive/conservative working capital policies and profitability as well as risk of firms for 59 industrial companies listed at Amman Stock Exchange for the period of 2004-2007

HYPOTHESES

This study has tested the following null hypotheses on the relation between the defined variables and working capital policies of listed companies:

H0: There is no significant relationship between working capital policies and Return on Assets (ROA) of Jordanian industrial companies.

H0: There is no significant relationship between working capital policies and Return on Equity (ROE) of Jordanian industrial companies

H0: There is no significant relationship between working capital policies and Tobin's (Q) of Jordanian industrial companies.

H0: There is no significant relationship between working capital policies and risk of Jordanian industrial companies.

IMPORTANCE AND CONTRIBUTION OF THIS STUDY

The main objective of the working capital management is to maintain an optimal balance between each of the working capital components. Business success heavily depends on the ability of financial executives to effectively manage receivables, inventory, and payables (Filbeck and Krueger 2005).

Firms can reduce their financing costs and/or increase the funds available for expansion projects by minimizing the amount of investment tied up in current assets. Most of the financial managers' time and effort are dedicated to bringing non-optimal levels of current assets and liabilities back toward optimal levels (Lamberson 1995). An optimal level of working capital would be the one in which a balance is achieved between risk and efficiency. It requires continuous monitoring to maintain proper level in various components of working capital i.e. cash receivables, inventory and payables etc.

In general, current assets are considered as one of the important components of total assets of a firm. A firm may be able to reduce the investment in fixed assets by renting or leasing plant and machinery, whereas, the same policy cannot be followed for the components of working capital. The high level of current assets may reduce the risk of liquidity associated with the opportunity cost of funds that may have been invested in long-term assets.

The impact of working capital policies on profitability is highly important. However, little empirical research has been carried out to examine this relationship. This paper investigates the potential relationship of aggressive/conservative policies with the accounting and market measures of profitability as well as the risk factor of Pakistani firms. The present study is expected to contribute to better understand these policies and their impact on profitabil-

ity especially in the emerging markets like Jordan.

The study analyzes the working capital management practices and impact on profitability and risk of Amman industrial Firms listed in Amman Stock Exchange for the period of 2004 to 2007.

THEORETICAL FRAMEWORK:

OPERATIONAL RISK ONCEPTUAL APPROACH

Recently the changes that have taken place in the financial market because of the development of new activities and implementation of new products generate new types of risks, which are more complex and bigger. A recent category is represented by the relative operational risk, for which the Basel Committee elaborated standards and regulations. In this way it recognized the impact of this risk for the activity of the credit institution. The past experiences indicated that in the case in which the financial institution has not an adequate risk management, it is exposed to jeopardy which can be transformed into important losses. These losses can generate even the cessation of the institution activity. The Basel Committee considers the operational risk a distinct category, as the credit risk or the market risk. It defines the operational risks as "the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events". It also takes into consideration the legal risk, but excludes categorically the strategic and reputation risks, Willem Yu (2005)

According to Merrill Lynch, this definition does not explain clearly how should be interpreted the nature and the measure of the indirect losses. This obliges the financial institutions to have their own definitions, but this will create insubstantiality. Because of the fact the Basel Committee wanted to underline only the minimum standards for all the financial institutions, as well as the non-existence of a concrete definition of this risk, in practice were adopted the list of risk categories and the analysis of each one.

The separation was made in order to cover all the possible operational risks and to concentrate on the most significant causes of the loss severity met day by day. The specialized literature presents the opinions of more authors regarding the operational risk area. Therefore in 2001, The PNC Financial Services Group recommended a more concise definition for the operational risk, a definition that should be based more on direct losses and which excludes categorically the business risk, the strategic risk and the reputation risk: "the operational risk is the risk of the income direct loss, which results from internal events connected to inadequate personal, important errors or illegal behavior because of the errors or the systems and processes inadequate, or from external events where the risks are not covered by the credit, market or interest rate risk". Thus the operational risk can be interpreted as a vulnerability of the financial institution that can be reduced or eliminated though an increased control, Shevchenko., (2004)

The important increase of the operational risk is due to organizational, infrastructure, business environment or improvement changes. These changes were materialized in the development of the technology, the increase of the attention to the transparency, the increase of the electronic commerce, the increase of the operations for the natural person and small economic agents, deregulation, the incompatibility of the systems, the increasing use of the automatic technologies, globalization, the increasing use of the external sources and the complicated technologies to reduce the credit and market risks. All these determined a healthy management of the operational risk and the inclusion in the internal process of a bank. Financial institutions consider that this risk appears in the departments called "Operations" and are concretized into potential losses generated by errors and controls systems and processes omissions. It is necessary to have a special department for the operational risk. Some institutions that consider the operational risk as the risk that does not harmonize with the credit or market risks and which incorporates all the risks, except the credit risk and the market risk, in order to take into consideration all the potential influences over the profit and losses account. This thing brought some problems and thus the financial institutions decided to limit themselves to things that can be measured easily. de Fontnouvelle, Jordan, Rosengren (2004)

For a banking-financial institution we

can mention a series of main operational risk factors, as: internal fraud, external fraud, employment practices, the job safety, clients, products and business practices, bank's products and operation practices, the technical infrastructure deficiency, activity disturbances and system defections. For a good management of the operational risk there are six steps that have to be followed: identification of the risk type, identification of the risk factors, the exposure to the risk rank evaluation, the risks estimation, the loss and profit estimation and source explanation, the comparison of the risk with the profitability of each risk type being compulsory to know the potential loss or the causes that generated this type of risk., Moscadelli (2004).

THE OPERATIONAL RISK MANAGEMENT

Recently, more and more authors have been interested in the operational risks, especially due to the fact that operational risk can appear not only for banks. Until now, most of the banks considered operational risk through the past events. Therefore, because they hadn't an operational risk management they pointed out more the effects and less the causes. But recently, the Basel Committee proposed the responsibilities share between the risk management and the operational risk management. For an adequate operational risk management, has to be respected the second pillar of the Basel Agreement.

Basel II defines operational risk as "the risk of loss resulting from inadequate

or failing internal process, people and systems or from external events". Although this definition is generally accepted by the banking industry, certain risk analysts believe the definition to be flawed. Therefore there is still no standardized definition of operational risk. However, with the introduction of Basel II, all definitions converge around the one suggested by the new accord . Another important implementation of Basel II is that it requires banks to collect data on operational losses. This mandatory data collection progress allows risk analysts to scrutinize the behavior of operational losses systematically. The accord also has given guidance to three broad approaches of measurement of operational risk. The ability to quantify operational risk has important policy implications as Basel II introduces a new regulatory capital charge for banks' internal modeling of operational losses, . Scurr, S. Bozhkov, . Serguieva, K. Yu, . Dolutas,(2008).

ABILITY TO FINANCE OPERATING WORKING CAPITAL

Positive net investments in operating working capital require financing. Firms with limited financial resources, more expensive costs of external financing, weaker access to capital markets, reduced bargaining power, and exhibiting financial distress will find financing more problematic.

1. OPERATING CASH FLOW CAPITAL

Positive operating cash flow enables firms to finance a positive working

capital requirement, allowing a more conservative operating working capital strategy, thereby facilitating future sales growth. However, firms with negative operating cash flows must finance a positive working capital requirement through other sources. Love, Preve, and Sarria-Allende (2007) estimate a direct relation between net trade credit and cash flow for a sample of firms in emerging market countries.

Thus, we expect a positive correlation between working capital requirements and cash flow. To relieve endogenous concerns, cash flow is measured as lagged operating income before depreciation minus income taxes scaled by net assets.

2. ASYMMETRIC INFORMATION AND COSTS OF EXTERNAL FINANCING

Myers and Majluf (1984) show that capital markets extract a premium for the external financing of firms with greater informational asymmetries because such firms' projects and cash flows are more difficult to value, leading firms to

follow a financing pecking order, exhausting the lowest cost sources of capital first. A positive working capital requirement must be financed. They expect less transparent firms to have a reduced working capital requirement since firms with greater informational asymmetries typically pay greater rates in order to borrow. The lagged market-to-book ratio is used as a proxy for the degree of asymmetric information, where market-to-book is defined as the sum of market value of equity and total

liabilities minus payables scaled by net assets. We expect an inverse relation between the working capital requirement and the market-to-book ratio.

3. CAPITAL MARKET ACCESS

Creditworthy firms with superior capital market access are more capable of financing the working capital gap externally. Brennan and Hughes (1991) argue that larger firms are covered more intensely by analysts, whose increased monitoring reduces informational asymmetries, implying that larger firms enjoy ready access to capital relative to smaller firms. Since this study examines the determinants of net operating working capital, we emphasize commercial paper issues and bank debt.

While larger firms find it easier to finance relaxed credit and inventory policies, smaller firms are less able to issue commercial paper or negotiate lines of credit. Having fewer ways to finance receivables, smaller firms rely on factoring more than large firms. Whited (1992) finds that larger firms face fewer borrowing constraints than smaller firms because the former have better capital market access. Petersen and Rajan (1997), show that receivables are directly related to size, and they report a weak positive relation between payables and size, but Deloof and Jegers (1999) report that payables are insignificantly related to size.

4. MARKET POWER

The length of trade credit terms are directly related to market power as more

valuable customers can negotiate more generous credit terms with suppliers. In addition, firms with greater market share can stretch the credit terms offered by suppliers with little repercussion as contracts with industry leaders are critical to the viability of smaller suppliers. Similarly, strong relationships with vendors allow firms with greater market power to hold fewer inventories. Suppliers with more market power relative to customers can negotiate shorter terms with customers for at least two reasons.

First, the level of competition from rival firms is reduced for firms with large market share, which decreases the likelihood of losing customers over a reduction in credit terms. Second, suppliers with large market share are more likely to have forged longer relationships with clients, implying high costs of switching suppliers. These switching costs include learning and transactions costs as documented by Kemmerer (1987) and Chevalier and Scharfstein (1987). Molina and Preve (2008) show that, compared to firms in competitive industries, firms in concentrated industries tighten credit policy to a greater extent when facing financial distress.

5. FINANCIAL DISTRESS

Distressed firms have limited financial slack and cash generating ability, and the strain of financial distress may cause firms to reduce investment in operating working capital by collecting on receivables, tightening credit terms, liquidating existing inventory, and by stretching credit terms granted by sup-

pliers. Molina and Preve (2008), show that financially distressed firms have significantly reduced levels of trade credit relative to their non-distressed counterparts. We expect the working capital requirement to correlate inversely with financial distress.

Following Molina and Preve (2008), a firm must satisfy two criteria to be classified as financially distressed: the firm must have difficulty covering interest payments and be over-leveraged. The first component is having a coverage ratio, calculated as operating income before depreciation divided by interest expense, less than one for two consecutive years, or less than 0.80 in any given year. Second, a firm is considered over-leveraged if its leverage ratio is in the top two deciles of its industry's leverage ratio in a given year.

PREVIOUS EMPIRICAL EVIDENCE:

Finally, Afza and Nazir (2007) investigated the relationship between the aggressive/conservative working capital policies for seventeen industrial groups and a large sample of 263 public limited companies listed at Karachi Stock Exchange for the period 1998-2003. Using ANOVA and LSD test, the study found significant differences among their working capital investment and financing policies across different industries. Moreover, rank order correlation confirmed that these significant differences were remarkably stable over the period of six years of study. Ordinary least regression analysis found a negative relationship between the profit-

ability measures of firms and degree of aggressiveness of working capital investment and financing policies. The current study further investigates the impact of the degree of aggressiveness of working capital policies on market measures of profitability i.e. market rate of return and Tobin's q as well as the risk of firms.

In the Pakistani context, Rehman (2006) investigated the impact of working capital management on the profitability of 94 Pakistani firms listed at Islamabad Stock Exchange (ISE) for the period 1999-2004. He studied the impact of the different variables of working capital management including Average Collection Period, Inventory Turnover in Days, Average Payment Period and Cash Conversion Cycle on the Net Operating Profitability of firms. He concluded that there is a strong negative relationship between above working capital ratios and profitability of firms. Furthermore, managers can create a positive value for the shareholders by reducing the cash conversion cycle up to an optimal level

Filbeck and Krueger (2005) highlighted the importance of efficient working capital management by analyzing the working capital management policies of 32 non-financial industries in USA. According to their findings significant differences exist between industries in working capital practices over time. Moreover, these working capital practices, themselves, change significantly within industries over time.

Sathyamoorthi (2002) focused on good corporate governance and in turn effective management of business assets. He observed that more emphasis is given to investment in fixed assets both in management area and research. However, effective management working capital has been receiving little attention and yielding more significant results. He analyzed selected co-operatives in Botswana for the period 1993-1997 and concluded that an aggressive approach has been followed by these firms during all the four years of study.

Pandey and Parera (1997) provided an empirical evidence of working capital management policies and practices of the private sector manufacturing companies in Sri Lanka. The information and data for the study were gathered through questionnaires and interviews with chief financial officers of a sample of manufacturing companies listed on the Colombo Stock Exchange. They found that most companies in Sri Lanka have informal working capital policy and company size has an influence on the overall working capital policy (formal or informal) and approach (conservative, moderate or aggressive). Moreover, company profitability has an influence on the methods of working capital planning and control

However, Weinraub and Visscher (1998) discussed the issue of aggressive and conservative working capital management policies by using quarterly data for the period 1984 to 1993 of US firms. Their study looked at ten diverse industry groups to examine the

relative relationship between their aggressive/conservative working capital policies. The authors have concluded that the industries had distinctive and significantly different working capital management policies. Moreover, the relative nature of the working capital management policies exhibited remarkable stability over the ten-year study period. The study also showed a high and significant negative correlation between industry asset and liability policies and found that when relatively aggressive working capital asset policies are followed they are balanced by relatively conservative working capital financial policies.

POPULATION AND SAMPLE SELECTION

The empirical investigation on the determinants of capital structure sampled industrial firms. All firms that have been listed on the Amman Stock Exchange (ASE) during the four-year period, 2004–2007, were sampled. Fifty nine firms qualified to be included in the study sample. The data for the empirical analysis were derived from the financial statements of these firms. The reason for restricting the number of sample to 59 firms from 76 firms as population of industrial firms was that the latest data for the study were available for these years and derived from companies guide. This was a limitation of the study sample.

RESEARCH DESIGN AND HYPOTHESES

- SPECIFICATION OF THE MODEL

The study used aggressive investment policy and conservative investment policy as measuring variables of working capital management. Aggressive Investment Policy (AIP) results in minimal level of investment in current assets versus fixed assets. In contrast, a conservative investment policy places a greater proportion of capital in liquid assets with the opportunity cost of lesser profitability. In order to measure the degree of aggressiveness, the following ratio will be used

$$AIP = \frac{\text{Total Current Assets (TCA)}}{\text{Total Assets (TA)}}$$

: Where a lower ratio means a relatively aggressive policy.

Aggressive Financing Policy (AFP) utilizes higher levels of current liabilities and less long-term debt. In contrast, a conservative financing policy uses more long-term debt and capital. The degree of aggressiveness of a financing policy adopted by a firm will be measured by:

$$AFP = \frac{\text{Total Current Liabilities (TCL)}}{\text{Total Assets (TA)}}$$

: Where a higher ratio means a relatively aggressive policy.

The impact of working capital policies on the profitability will be analyzed through frequently used profitability measures i.e. Return on Assets (ROA)

and Return on Equity (ROE) as well as market measure and Tobin’s q by running cross-sectional regressions. The regression models to be estimated are

$$ROA_{it} = \alpha + \beta_1 (TCA/TA_{it}) + \beta_2 (TCL/TA_{it}) + \varepsilon \text{----- (1)}$$

$$ROE_{it} = \alpha + \beta_1 (TCA/TA_{it}) + \beta_2 (TCL/TA_{it}) + \varepsilon \text{----- (2)}$$

$$\text{Tobin's } q_{it} = \alpha + \beta_1 (TCA/TA_{it}) + \beta_2 (TCL/TA_{it}) + \varepsilon \text{----- (3)}$$

Where:

ROA_{it} = Return on Assets of Firm i for time period t

ROE_{it} = Return on Equity of Firm i for time period t

Tobin’s q_{it} = Value of q of Firm i for time period t

TCA/TA_{it} = Total Current Assets to Total Assets Ratio of Firm i for time period t

TCL/TA_{it} = Total Current Liabilities to Total Assets Ratio of Firm i for time period t

α = intercept

ε = error term of the model

The impact of the working capital assets management and financing polices on the relative risk will be measured by applying regression models for the risk of the company and its working capital management policies over the period of 2004-2007. The regression equations are:

$$SDSales' = \alpha + \beta_1 (TCA/TA_{it}) + \beta_2 (TCL/TA_{it}) + \varepsilon \text{..... (4)}$$

$$SDROA_i = \alpha + \beta_1 (TCA/TA_{it}) + \beta_2 (TCL/TA_{it}) + \varepsilon \text{..... (5)}$$

$$SDROE_i = \alpha + \beta_1 (TCA/TA_{it}) + \beta_2 (TCL/TA_{it}) + \varepsilon \text{.....(6)}$$

$$SDq_i = \alpha + \beta_1 (TCA/TA_{it}) + \beta_2 (TCL/TA_{it}) + \varepsilon \text{..... (7)}$$

Where:

SDi = Standard Deviation representing risk of Firm i

DATE AND MAIN EMPIRICAL RESULTS:

Equation (1) has been estimated for 59 industrial firms for the period 2004-2007 and results are reported in Table 1. For each year, TCA/TA and TCL/TA ratios have been regressed against ROA values, and the five regression models indicating the impact of working capital policies on the profitability of firms in Jordanian. The model t-test and F-values and the SPSS statistics indicate overall best fit of the model. The t-statistics of both TCA/TA and TCL/TA are statistically significant at 1%,5%, 10% level for ROA for all the years except

for the years 2006 and 2007.

The positive coefficient of TCA/TA shows a negative relationship between the degree of aggressiveness of investment policy and return on assets. As the TCA/TA increases, degree of aggressiveness decreases, and return on assets goes up. Therefore, there is negative relationship between the relative degree of aggressiveness of working capital financing policies and return on assets. The negative value of β coefficient for TCL/TA also points out the same negative relationship between the aggressiveness of working capital financing policy and return on assets. Higher the TCL/TA ratio, more aggressive the financing policy, that yields negative return on assets.

Table (1): Regression Analysis of Working Capital Policies and Return on Assets (ROA)

Year	Investment Policy		Financing Policy		+ Investment Policy Financial Policy	
	B-Coefficient	t-value (sig)	-B Coefficient	t-value (sig)	F-Value	sig
2004	.307	2.433(.018**)	-.267	-2.093(.041***)	14.155	.000***
2005	.239	1.860(.068*)	-.052	-.392(.967)	2.019	.142
2006	.198	1.525(.133)	.116	.888(.380)	1.406	.254
2007	.195	1.498(.140)	.039	.295(.769)	1.154	.323
2007-2004	.277	3.564(.000***)	-.052	-.798(.426)	8.971	.000***

***Significant at 1% **Significant at 5% *Significant at 10%

The results of regression model (2) have been reported in Table 2, where the dependant variable is return on equity having the same independent variable of working capital investment policy and working capital financing policy. As the degree of aggressiveness of working capital policies tends to increase, the returns are likely to de-

crease. Though, the results are statistically highly impressive which is apparent from the high level of significance of b coefficients and t-values. However, they predict a negative relationship between the degree of aggressiveness of working capital policies and accounting measures of returns. To further validate the above-mentioned results, the

Table (2): Regression Analysis of Working Capital Policies and Return on Equity (ROE)

Year	Investment Policy		Financing Policy		+ Investment Policy Financial Policy	
	B-Coefficient	t-value (sig)	-B Coefficient	t- value (sig)	F-Value	sig
2004	.269	2.109(.039**)	-.267	-2.093(.041***)	14.155.	.000***
2005	.324	2.590(.012**)	-.052	-.392(.967)	2.019.	.142
2006	.265	2.078(.042**)	.116	.888(.380)	1.406	.254
2007	.280	2.199(.032**)	.039	.295(.769)	1.154	.323
2004-2007	.269	4.281(.000***)	-.052	-.798(.426)	8.971	.000***

***Significant at 1% **Significant at 5% *Significant at 10%

impact of working capital investment and working capital financing policy has also been examined on the market returns. Tobin's q has been used as a measure of market returns and for each year from 2004 to 2007. A q value of greater than 1 indicated the greater perceived value given by the investor to the firm. The results of equation (3) are presented in Table 3. The results reported in first panel of Table 3 are in accordance with results of Table 1 and Table 2 highlighting that the market returns on Tobin's q are decreasing as the firms are following the aggressive investment policy by keeping a low level of current assets in the firm. This similarity in market and accounting returns confirms the notion that investors do not believe in the aggressive approach of working capital management, hence, they don't give any additional value to the firms in the Amman Stock Exchange

However, there are some dissimilarities, which are found in the relationship of financing policy and Tobin's q. In the years 2005, 2006 and 2007 the relationship between working

capital financing policy and Tobin's q was positive, indicating that the higher the degree of aggressiveness of working capital financing policy, the greater the investor's value given to the firm.

Finally, to empirically test the theory of Van-Horne and Wachowicz (2004), impact of working capital policies on risk of the firm has been investigated by regressing the ordinary least square regressions for equations 4-7. The risk is measured by the standard deviation of sales and different return measures as operating and financial risk respectively.

The standard deviation has been estimated over the four years from 2004 to 2005 and then five regressions have been run for working capital investment and working capital financing policy. The results are reported in Tables 4 to 7. The positive β coefficients of SDSales, SDROA, SDROE and SDTobin's q indicate negative relationship between the risk measurements and the working capital investment policy. On the other hand, similar a relationship has been

found for the working capital financing policy. The increased variation in sales and profitability is attributed to increasing the level of current assets and decreasing the level of current liabilities in the firm. However, these results are not statistically significant except the SDROA ,SDROE in years 2004,2005 and in all years from 2004 to 2007 .

In general, there is no statistically significant relationship between the level

of current assets and current liabilities and operating and financial risk of the Amman industrial firms.

Table (3): Regression Analysis of Working Capital Policies and (Tobin's Q)

Year	Investment Policy		Financing Policy		+ Investment Policy Financial Policy	
	B-Coefficient	t-value (sig)	-B Coefficient	t-value (sig)	F-Value	sig
2004	.069	2.520(.050 [*])	-.024	-.184(.854)	.268	.766
2005	.095	.723(.473)	.166	1.271(.209)	.891	.416
2006	-.074	-.564(.575)	.164	1.152(.206)	3.040	.036 ^{**}
2007	-.114	-.866(.390)	-.052	-.393(.696)	.370	.692
2004-2007	-.020	-2.306(.080 [*])	.045	.682(.496)	4.403	.062 [*]

***Significant at 1% **Significant at 5% *Significant at 10%

Table (4): Regression Analysis of Working Capital Policies and Risk (Standard Deviation of Sales (SDSales))

Year	Investment Policy		Financing Policy		+ Investment Policy Financial Policy	
	B-Coefficient	t-value (sig)	-B Coefficient	t-value (sig)	F-Value	sig
2004	-.043	-.325(.746)	-.081	-.614(.542)	.185	.831
2005	.017	.125(.901)	-.120	-.910(.367)	.469	.628
2006	.019	-.140(.889)	.025	.187(.852)	.031	.970
2007	-.007	-.051(.959)	-.138	-1.050(.298)	.620	.542
2007-2004	-.018	-.276(.783)	-.075	-1.144(.426)	.661	.517

***Significant at 1% **Significant at 5% *Significant at 10%

Table (5): Regression Analysis of Working Capital Policies and Risk (Standard Deviation of Return on Assets (SDROA))

Year	Investment Policy		Financing Policy		+ Investment Policy Financial Policy	
	B-Coefficient	t-value (sig)	-B Coefficient	t- value (sig)	F-Value	sig
2004	-.117	-.890(.377)	.509	4.462(.000***)	3.031	.056*
2005	-.147	-1.120(.267)	-.029	-.219(.827)	3.129	.052*
2006	-.120	-.913(.365)	.006	.048(.962)	.422	.658
2007	-.047	-.354(.724)	.045	.341(.734)	.197	.821
2007-2004	-.103	-1.580(.115)	.054	.826(.410)	2.361	.097*

***Significant at 1% **Significant at 5% *Significant at 10%

Table (6): Regression Analysis of Working Capital Policies and Risk (Standard Deviation of Return on Equity (SDROE))

Year	Investment Policy		Financing Policy		+ Investment Policy Financial Policy	
	B-Coefficient	t-value (sig)	-B Coefficient	t- value (sig)	F-Value	sig
2004	-.154	-1.176(.245)	.433	3.625(.000***)	16.881	.000***
2005	-.090	-.679(.500)	.274	2.150(.036**)	.618	.543
2006	-.165	-1.266(.211)	.160	1.222(.227)	1.795	.330
2007	-.150	-1.146(.257)	.058	.439(.662)	1.132	.821
2007-2004	-.138	-2.131(.030**)	.218	3.417(.001***)	12.399	.000***

***Significant at 1% **Significant at 5% *Significant at 10%

Table (7): Regression Analysis of Working Capital Policies and Risk (Standard Deviation of Tobin's Q (SDq))

Year	Investment Policy		Financing Policy		+ Investment Policy Financial Policy	
	B-Coefficient	t-value (sig)	-B Coefficient	t- value (sig)	F-Value	sig
2004	-.058	-.436(.664)	-.007	-.054(.957)	.112	.894
2005	-.044	-.330(.743)	.055	.416(.679)	.182	.834
2006	.199	.905(.369)	-.215	-1.166(.101)	2.039	.140
2007	.072	.547(.587)	.034	.258(.798)	.148	.863
2007-2004	-.009	-.133(.894)	.043	.653(.514)	.288	.755

***Significant at 1% **Significant at 5% *Significant at 10%

The above results contradict those of Gardner et al. (1986), and Weinraub & Visscher (1998), However, they agree with the results of Afza and Nazir (2007) and produced a negative relationship between the aggressiveness of working capital policies and accounting measures of profitability.

Although, the results of all return variables are significant, however, model (1) produced broader and more consistent results as compared to model (2) and (3) where F-value and β coefficients are highly significant. Market returns (Tobin's q) are slightly less significant in our study which is attributed to the more volatile stock market of Jordan. The Amman Stock Market is said to be heavily overvalued stock market, and hence, the results based on market share price data are more inconsistent. Moreover, results of Tables 4-7 confirmed the results of Carpenter and Johnson (1983) that there is no statistically significant relationship between the working capital levels and the operating as well as financial risk of the firms.

CONCLUSION AND RECOMMENDATIONS

The study investigated the relative relationship between the aggressive/conservative working capital policies for 59 industrial companies listed at the Amman Stock Exchange for the period of 2004-2007. The impact of aggressive/conservative working capital investment and financing policies has been examined through cross-sectional regression models between working capital policies and profitability as well

as risk of the firms. The results show a negative relationship between the profitability measures of firms and degree of aggressiveness of working capital investment and financing policies. The firms yield negative returns if they follow an aggressive working capital policy.

These results are further validated by examining the impact of aggressive working capital policies on market measures of profitability which was not tested before. The results of Tobin's q were in line of the accounting measures of profitability and produced almost the same results. Moreover, they also confirmed the findings of Carpenter and Johnson (1983) that there is no significant relationship between the aggressiveness/conservativeness of working capital policies of firms and their operating and financial risk. When used as a new measure of profitability i.e. Tobin's q to estimate the relationship of working capital management and firm returns in Amman, the present study is expected to be a significant contribution in finance literature. Moreover, theoretical discussion on risk and working capital management has also been tested on empirical basis in an emerging market of Jordan. Although the results of present study are in contradiction with some earlier studies on the issue, this phenomenon may be attributed to the inconsistent and volatile economic conditions of Jordan. The reasons for this contradiction may further be explored in upcoming researches and this topic is left for the future.

Based on this research work, the researcher has proffered the following

recommendations:

-The financial manager should have knowledge of the sources of working capital funds as well as investment opportunities where idle funds may be temporarily invested. Recently the financial crises that happened at the end of 2008 in the global financial markets are very important to take into consideration and think about the working capital policies.

•The current assets at all times should be sufficiently in excess of current liabilities to constitute a buffer for maturing obligations within the ordinary operating cycle of a business.

-The management decisions concerning working capital should not be left to the financial manager alone. Other departmental heads should partake for optimality to be attained easily.

-The decision on how to optimize and finance current assets should be highly considered with care

REFERENCES

- Afza T and MS Nazir (2007).” Working Capital Management Policies of Firms: Empirical Evidence from Pakistan.” Presented at 9th South Asian Management Forum (SAMF) on February 24-25, North South University, Dhaka, Bangladesh

- A. Scurr, S. Bozhkov, A. Serguieva, K. Yu, O. Dolutas: “Quantifying Operational Risk of Financial Institutions”, International Federation of Operational Research Societies Conference, South Africa, 2008

- Brennan, M., and P. Hughes, (1991), “Stock Prices and the Supply of Information,” Journal of Finance 46, 1665-1691

- Carpenter MD and KH Johnson (1983). “The Association between Working Capital Policy and Operating Risk”. The Financial Review 18(3): 106-106.

- Chevalier, J. and D. Scharfstein, 1996, “Capital Market Imperfections and Countercyclical Markups: Theory and Evidence,” American Economic Review 86, 703-725.

- Deloof M (2003). “Does Working Capital Management Affect Profitability of Belgian Firms?” Journal of Business, Finance and Accounting 30(3&4): 573-587.

- Deloof, M., and M. Jegers, 1996, “Trade Credit, Product Quality, and Intragroup Trade: Some European Evidence,” Financial Management 25, 33-43.

-Filbeck G and T Krueger (2005).”Industry Related Differences in Working

Capital Management". Mid-American Journal of Business 20(2): 11-18.

-Gardner MJ, DL Mills, and RA Pope (1986). "Working Capital Policy and Operating Risk: An Empirical Analysis." The Financial Review 21(3): 31-31

- Hall C (2002). "Total" Working Capital Management". AFP Exchange 22(6): 26-32.

- Harris A (2005). "Working Capital Management: Difficult, but Rewarding." Financial Executive 21(4): 52-53
 - Klemperer, P., 1987, "Markets with Consumer Switching Costs," The Quarterly Journal of Economics 102, 375-394.

- Lamberson M (1995). "Changes in Working Capital of Small Firms in Relation to Changes in Economic Activity." Mid-American Journal of Business 10(2): 45-50.

- Love, I., L. Preve, and V. Sarria-Alende, (2007), "Trade Credit and Bank Credit: Evidence from Recent "Financial Crises," Journal of Financial Economics 83, 453-469.

- Molina, C. and L. Preve, (2008), "Trade Receivables Policy of Distressed Firms and its Effect on the Cost of Financial Distress," Financial Management, forthcoming

- Myers, S., Majluf, N., (1984), "Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have," Journal of Financial Economics 13, 187-221.

-Moscadelli, Marco (2004) "The Modeling of Operational Risk: Experience With the Analysis of the Data Collected by the Basel Committee". Technical

Report 517, Banca d'Italia.

- Pandey IM and KIW Parera (1997). Determinants of Effective Working Capital Management - A Discriminate Analysis Approach." IIMA Working Paper # 1349. Research and Publication Department Indian Institute of Management Ahmedabad India

- Petersen, M., and R. Rajan, (1997), "Trade Credit: Theories and Evidence," Review of Financial Studies 10, 661-691.

- P. de Fontnouvelle, Jordan J, Rosengren E (2004) - "Implications of Alternative Operational Risk Modeling Techniques" NBER Working Paper No. W11103

- Rehman A (2006)." Working Capital Management and Profitability: Case of Pakistani Firms" (Unpublished Dissertation). Pakistan: COMSATS Institute of Information Technology, Islamabad

- Shin, H and L Soenen (1998). "Efficiency of Working Capital and Corporate Profitability". Financial Practice and Education 8: 37-45.

- Sathamoorthi CR (2002). The Management of Working Capital in selected co-operatives in Botswana. Finance India Dehli 16(3): 1015-1034.

- Shevchenko Pavel V., (2004) „Valuation and Modelling Operational Risk: Advanced Measurement Approach" CSIRO Mathematical and Information Sciences, Sydney, Australia

- Van-Horne JC and JM Wachowicz (2004). Fundamentals of Financial Management (12th Edition). New York: Prentice Hall Publishers

- Weinraub HJ and S Visscher (1998). "Industry Practice Relating To Aggressive Conservative Working Capital Pol-

icies.” Journal of Financial and Strategic Decision 11(2): 11-18.

- Whited, T. M., (1992), “Debt, Liquidity Constraints, and Corporate Investment: Evidence from Panel Data,” Journal of Finance 47, 1425-1460.

-Willem Yu (2005) “New Capital Accord Basle II Using LDA Approach for Measuring Operational Risk?” Amsterdam Vrije Universiteit Faculteit der Exacte Wetenschappen Studierichting Bedrijfskunde en Informatica