Corporate Investments and the Dual-Role of Working Capital: Evidence from Thailand

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Abstract

A firm can undertake corporate investments arising from growth opportunities only if it has the required level of liquidity. A clear understanding of the complex relationship between corporate investments and liquidity could help firms to gain benefits from growth opportunities. While the study supports several previous studies on the sensitivity of investments to liquidity, it more importantly contributes to the literature on working capital by showing the dual-role of working capital in relation to corporate investments. Drawing upon Shulman and Cox's (1985) Net Liquidity Balance (NLB) and Working Capital Requirement (WCR) as proxy for net working capital, the study develops a model to test the two hypotheses.

Using the data collected from listed service firms in the Thailand Stock Exchange, the study found that while NLB has a significant positive relationship with corporate investments, WCR has a significant negative relationship with corporate investments. The study also finds that firms manage WCR efficiently during growth opportunities in order to enhance NLB.

Keywords

Capital Expenditure
Working Capital
Net Liquidity Balance
Working Capital Requirement

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Introduction

The capital structure of a firm becomes increasingly relevant for capital investment decisions as the tendency for capital markets to be imperfect increases (Cleary, 1999; Myers, 1984; Myers and Majluf 1984). More specifically, due to uncertainty in capital markets, internal funds, in terms of working capital, have become an important determinant of capital investments. Cleary (1999, p. 673) argues that the use of internally generated funds for corporate investment has "a cost advantage" over the funds collected externally from capital markets. Boyle and Guthrie (2003) also confirm that firms are unable to undertake profitable projects when sufficient amount of internal funds, in terms of liquidity, is not available. Further, they demonstrate that "projects are essentially "now-or-never" investments" and that a shortage of liquidity could adversely affect current investment opportunities (Boyle and Guthrie, 2003, p. 2143).

Although the existing literature acknowledges the relationship between working capital and capital investment, there is no consensus about the exact nature of this relationship (Chava and Roberts, 2008; Stein, 2003; Charlton et al., 2002). For instance, a number of studies, including Boyle and Guthrie (2003) and Fazzari et al. (1988) found a significant positive relationship between corporate investments and liquidity in financially constrained firms while Kaplan and Zingales (1997) and Cleary (1999) revealed that investment decisions of least financially constrained firms are more sensitive to liquidity.

Further, Kaplan and Zingales (1997) found a high positive relationship between investments and liquidity for high creditworthy firms than for those that are low creditworthy.

Whilst the existing literature, in general, suggests corporate investment decisions and working capital are related, this study aims to demonstrate that corporate investments and working capital has a dual relationship. For this purpose, the study adopts Shulman and Cox's (1985) model, and use Net Liquidity Balance (NLB) and Working Capital

Requirements (WCR) as proxy for Net Working Capital (NWC) (which measures liquidity). The findings show that while the relationship between corporate investments and NLB is positive and significant, WCR is related to corporate investments negatively, and also significant.

The study proceeds as follows. Next section provides the literature on working capital and develops the hypotheses. Subsequent section elaborates on research design including a model development. The final two sections discuss empirical results and provide concluding comments and recommendations respectively.

Literature Review and Hypotheses Development

Working Capital

Working capital management has been recognised as an important area in financial management and, considerable amount of time and effort is being spent by financial managers of firms to make the best use of working capital (Rao 1989). The money tied up in working capital is costly since it earns zero or low rate of return (Kim et al., 1998). However, the management of working capital efficiently stimulates growth opportunities and enables to avoid the costly interruptions of firms' day to day operations (Ross et al., 2005).

Working capital involves current assets and current liabilities of a firm. A firm's investment in working capital is the difference between its short term assets and liabilities, and is referred to as net working capital (Brealey et al., 2000, p. 133). Net working capital (NWC) is recognised as a measurement of liquidity which shows the ability of a firm "to take advantage of favourable discounts or profitable business opportunities as they come into being" (Wang, 2002, p 159). The greater the firm's investment in current assets, the greater is the liquidity, and the greater the reliance on current liabilities the lower is the liquidity of the firm (Keown et. al., 2001).

Shulman and Cox (1985) argue that the traditional measure of working capital i.e., the difference between short term assets and liabilities does not provide a correct understanding of the liquidity of a firm. This is

mainly because the components of NWC have varying degrees of liquidity. While some components of NWC (eg., cash, investment in marketable securities, current payable portion of long-term loans, payable treasury bills,) are of financial nature and have relatively high liquidity, there are other components that represent non financial items and have relatively low liquidity (eg., accounts receivables and accounts payables). Shulman and Cox (1985) classify components in NWC into two categories as financial items and non-financial items, and refer to the difference between current assets and current liabilities under 'financial items' as Net Liquidity Balance (NLB) and the difference between current assets and current liabilities under 'non-financial items' as Working Capital Requirement (WCR). Hence, the composition of NWC is as follows:

$$NWC = NLB + WCR$$

Although the level of liquidity is different for WCR and NLB, they are highly interdependent. For example by reducing the collection period of accounts receivables (as an item of WCR), on the one hand a firm can reduce the WCR, and on the other hand, it can lead to an increase in the NLB (as a result of an increase in the cash balance). Shulman and Cox (1985) present the following two equations in order to calculate the two components of NWC based on the level of liquidity.

NLB = (cash and cash equivalents + short-term investment) - (short-term debt + commercial paper payable + long-term debt a year term).

WCR = (accounts receivable + inventories) - (accounts payable + accrued expenses + other payable)[1]

Shulman and Cox (1985) note NLB is a better indicator of liquidity than other indicators such as current ratio and quick ratio when predicting crisis and liquidity of a firm. Hawawini et al. (1986) also find that the evaluation of net working capital based on

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[1] These relate to the working cycle and thus are called working capital requirements.

NLB and WCR is more effective than using any traditional indicators for that purpose. Further, Chiou and Cheng (2006) use NLB and WCR to investigate the determinants of the working capital management.

Hypotheses Development and Research Framework

Growth is recognised as imperative to all firms irrespective of whether they are in growth industries or mature markets (Rich, 1999). Corporate investment is a fundamental requirement for firms that search for growth opportunities. According to Boquist et al. (1998), corporate investments distinguish the winner from the loser in the market place. However, the degree and the level of corporate investments are driven by the availability of required finances. Firms can find such funds from internal or external sources. As several studies highlight that the funds collected internally have lower costs than those collected externally (eg., Cleary, 1999; Smith, 1986; Boyle and Guthrie, 2003), mainly because of the costs associated with external sources due to market imperfections (eg., out-of-pocket expense to issue securities, agency and adverse selection) (Smith, 1986).
Firms maintain internally generated financial liquidity basically for the purpose of meeting its day to day business transaction (Ross et al., 2005). In addition, firms maintain some extra liquidity for both "precautionary purposes" in order to meet unexpected contingencies and "speculative purposes" in order to invest in future profitable business opportunities (Ross et al., 2005).

Maintaining liquidity for speculative purposes ensures that firms do not experience financial distress (Dasgupta and Sengupta, 2007) when undertaking profitable corporate investments. Firms that aim to undertake corporate investments, increases NLB, since more cash "looses restriction on current investments" while maintaining the "waiting less risky" (Boyle and Guthrie, p.2144, 2003). Jensen (1986) also suggests that firms should use all excess funds to undertake positive NPV projects. In other words, a high level of NLB is likely to encourage firms to undertake investments.

In turn, taking advantage of growth opportunities by undertaking corporate investments is likely to lead to increases in cash balances and short-term investments (i.e., resulting from increased revenue from new investments) (Kim et al., 1998; Opler et al., 1999). Similarly, Opler et al., (1999) argue that negative relationship between growth and investment could lead to decrease in cash holdings. Based on the above arguments, suggestions and findings of the existing literature, it can be hypothesised that NLB is positively related to corporate investments.

H1: *NLB is positively related to corporate investments.*

A relevant issue to the above hypothesis is the ways in which firms can increase NLB. A firm cannot stimulate growth opportunities and reduce financial risks, if its cash flows are locked in its receivables and inventory [WCR]. According to Gundavelli (2006, p. 52) "working capital tied up in cash flow is quickly being seen as a "hidden reservoir" of efficiencies that can be trapped to fund growth strategies, such as capital expansion". According to New AlixPartners'(2007) survey, there is an opportunity to increase cash holdings (NLB) by total of $800 billion by streamlining receivables and payables (WCR) of corporations across the globe, if CFOs expect to fund organic growths. According to Hawawini et al. (1986), a firm increases the level of NLB by increasing the efficiency with which it manages WCR. This can be done, for instance, by lengthening the terms to pay operation-related liabilities and accelerating operation-related receivables causing less demand on WCR. Consequently, when there are growth opportunities, firms are able to undertake corporate investments and reduce the demand for WCR in order to increase the amount of NLB. Based on this line of argument, it can be hypothesised that WCR is negatively related to corporate investment.

H2: *WCR is negatively related to corporate investments*

The following figure shows the theoretical framework adopted in this study.

Figure 1: Dual Role of Working Capital in Relation to Corporate Investments
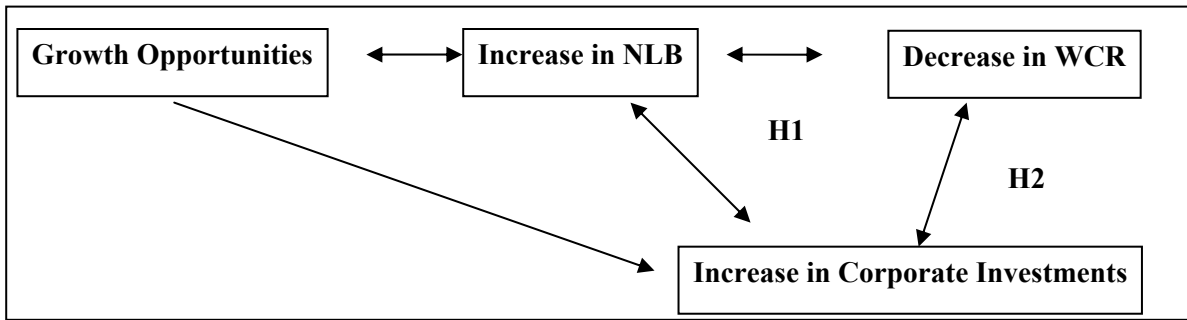
Research Design

Sample Selection and Data Collection

Much of the prior studies on liquidity/working capital have focused on manufacturing industry. This may be due to relatively high level of inventory maintained by firms in the manufacturing industry. Syson and Sperks (2004) note the high degree of focus of the existing literature on the tangible goods in manufacturing industry rather than intangible services. The importance of managing working capital is unique to all firms in the market as long as they are doing business on credit. Farris and Hutchison, (2002) find that the time period in operating cycle in respect of both accounts receivables and accounts payable are significantly higher than that of inventory. In other words, managing receivables and payables has become an important issue in both manufacturing and service industries (Farris and Hutchison, 2002). Charlton et al. (2002), also demonstrate that managing working capital differs across different industries and each industry needs special research attention in order to identify the sensitivity of corporate investment to liquidity. This study focuses on service industry and selected all listed firms in the service industry in Thailand. Table 1 highlights the nature of the firms included in the study.

The importance of emerging markets has become evident over the past few years. Firms in emerging markets are increasingly taking measures to control working capital in order to minimise risk and make optimal corporate investment decisions (Chakravarti , 2008), Thailand as one of the emerging markets has

seen substantial growth in recent times over other similar economies.

In 1990, Thailand was recognised as "Fifth Tiger" (Warr, 1999) since it was seen as one of the fastest growing economies in the Asia-Pacific region. Especially, there has been a dynamic change from industrial to service based economy (Manasserian, 2005).

From 2002 to 2005 the service sector accounted for approximately 48% of GDP in Thailand (Manasserian, 2005), compared to 33% in China and 48% in India (Malhotra et al., 2005). The scope of the service industry in Thailand includes both technical and non technical such as transportation, maintenance, tourism and leisure, hotel and catering, wholesale, retail, health, and education.

Table 1 - Nature of Participating Firms

Sector	No. of Companies	Percentage (%)
Media & Publishing	26	32
Tourism & Leisure	15	18
Retail/wholesale	15	18
Transportation & Logistics	13	16
Health Care Services	11	13
Professional Services	02	02
Total	**82**	**100**

Service firms listed in the Stock Exchange in Thailand were selected for the study since they are best exposed to growth opportunities driven by the emerging markets. Firms with

missing data were excluded from the study. The study also excluded the firms in financial and securities sector as their financial characteristics and the use of leverage are substantially different from other firms in the service industry.

After eliminating firms in those two categories, 82 firms remained in the sample used in the study (see Table 1) with 370 firm- years collectively.

Since the study is based on financial data, the main source of data was financial statements such as income statement, balance sheet and cash flow statements of the firms in the sample for the period from 2000 to 2005. At the time the study was conducted, the latest data available were for these six years. Annual reports of the firms were also used to understand the firms' background and the industry.

Variables

This study incorporates all the items (current assets and current liabilities) that affect working capital management of a firm and they are the dependent variable in this study. Corporate investment is the independent variable.

Independent Variables

Capital expenditure denotes corporate investments in this study and is the independent variable in the model used. The expenditure incurred by firms on acquisition and upgrading physical assets such as land, buildings, machinery, vehicles and equipments represent capital expenditure. Capital expenditure includes purchase cost of the asset, carriage inwards, insurance, legal and all other cost needed to get the assets ready for the use.

Dependent Variables

The dependent variables in this study are Net Liquidity Balance (NLB) and Working Capital Requirement (WCR). NLB incorporates financial items of working capital and is the difference between current assets and current liabilities under that category. WCR incorporates non-financial items of working capital and is the difference between current assets and current liabilities under that category.

Control Variables

Control variables include firm's operating cash flow (OCF) extracted cash flow statement, growth (GRO) of the firm measured by sales, leverage measured by total long-term debt capital divided by equity (D/E), operating expenditure (OPEX) (the cost of ongoing operation or system), finance expenditure (FIEX) (cost incurred on debt capital) and return on assets (ROA) measured by net profit divided by total assets.

Regression Model

The study uses panel data regression analysis of cross-sectional in order to test the hypothesis. The study uses the pooled regression type of panel data analysis. The pooled regression, which is also called the constant coefficients model, is the one in which both intercepts and slopes are constant, where the cross section firm data and time series data are pooled together in a single column assuming that there is no significant cross section or temporal effects.

The following general forms of models are developed to test the hypotheses.

$$NLB_{it} = \beta 0 + \sum_{all\ i}^{n} \beta_i X_{it} + \varepsilon \qquad (1)$$

$$WCR_{it} = \beta 0 + \sum_{all\ i}^{n} \beta_i X_{it} + \varepsilon \qquad (2)$$

Where:
WCR   : Working Capital Requirement of firm I at time t; i = 1, 2, …, 82 firms.
NLB it : Net Liquidity Balance of firm i at time t; i = 1, 2, …, 82 firms.
$\beta 0$: The intercept of equation
βi : Coefficients of X it variables
X it   : The different independent variables for working capital management of firm i at time t
t   : Time = 1, 2,……,6 years.
ε : The error term

The above general least squares models are converted into the following multiple linear regression models,

$$NLB_i = \beta\ OPEX_i + \beta\ FIEX_i + \beta\ CAPEX_i + \beta\ M/B_i + \beta\ Gth_i + \beta\ D/E_i + \beta\ OCF + \beta\ ROA + \varepsilon$$
(3)

$$WCR_i = \beta\ OPEX_i + \beta\ FIEX_i + \beta\ CAPEX_i + \beta\ M/B_i + \beta\ Gth_i + \beta\ D/E_i + \beta\ OCF + \beta\ ROA + \varepsilon$$
(4)

Where:
NLB = (cash & cash equivalents + short term investments) – (short term debt + commercial paper payable + Long term debt year term)

WCR = (accounts receivable + inventories) – (accounts payable + other payable).

[WCR equals net working capital minus NLB].

β = Coefficient of regression,
OPEX   = Operating expenditure
FIEX   = Financial expenditure
CAPEX = Capital expenditure
M/B   = Market to book value ratio
D/E   = Total debt to total assets
Gth   = Sales growth
ROA   = Return on assets
OCF   = Operating cash flow in firm
ε = the error term

Discussion of Empirical Results

Tables 2 and 3 present the results for the two multiple regression models. Table 2 summarises regression coefficient values of both control variables and independent variable in predicting dependent variables.

Table 3 shows the measures of possibility of two models in order to predict dependent variables. As shown in Table 2, the relationship between corporate investments (CAPEX) and Net Liquidity Balance (NLB) is positive and significant. Accordingly, corporate investment has 0.701 regression coefficient with a *p*-value of 0.000.

This finding supports the hypothesis (H1). As discussed in the hypotheses development section, service firms in Thailand appear to increase their cash holdings and cash equivalents (NLB) when they undertake corporate investments arising from growth opportunities. Firms also appear to increase their corporate investments when they have

excess liquidity. This relationship is consistent with, and supports, Mayer's (1990) empirical findings that the internal funding is the dominant soured of financing of corporate investments. This is also consistent with Boyle and Guthrie (2003) and Fazzari et al., (1988) where they found that corporate investment decisions are sensitive to the liquidity of the firm.

Table 2 shows that corporate investments have a significant negative relationship with Working Capital Requirement (WCR) with *p*-value 0.008. This result supports hypothesis (H2). This finding implies that firms are likely to manage WCR efficiently when growth opportunities exist. This finding is consistent with Hawawini et al., (1986) which reveals that firms increase the level of NLB by increasing the efficiency with which it manages WCR. This study shows that service firms in Thailand manage WCR efficiently in order to increase NLB as they undertake corporate investments arising from growth opportunities.

In addition to corporate investments, sales growth (Gth) and firms operating expenditure also have a significant relationship with both NLB and WCR. Sales growth shows significant positive relationship with both NLB and WCR with *p*-values of 0.008 and 0.000 respectively.

This suggests that an increase in sales when growth opportunities exist tend to increase NLB and WCR. This relationship supports the findings of Opler et al. (1999) where they argue that growth opportunities increase the cash and cash equivalents of the firm. Similarly, firms' operating expenditure shows a significant negative relationship with both NLB and WCR with p-value 0.003 and 0.000 respectively.

It is almost certain that a firm can increase both NLB and WCR by decreasing its operating expenditure. For example, a decrease in operating expenditure can lead to, either an increases in the cash holdings or decrease in accounts payables as a result of the firm saving cash from decreased operating expenditure.

Table 2: Regression Results for the Total Sample (370)

Variables	NLB		WCR	
	Coefficient	*p-values*	*Coefficient*	*p-values*
OPEX	-0.649	0.003***	-0.490	0.000***
INEX	-3.893	0.000***	0.160	0.358
CAPEX	0.701	0.000***	-0.065	0.008***
OCF	0.254	0.183	-0.507	0.000***
M2B	8.329	0.896	-2.048	0.938
Gth	0.604	0.008***	0.431	0.000***
ROA	-3.928	0.657	5.951	0.104
D2E	0.042	0.899	0.071	0.606
***, **, * significant at 0.01, 0.05, and 0.1 levels respectively.				

Table 3 shows the summary of ANOVA test results of the two models [(3) and (4)]. As shown in Table 3, the results suggest that both regression models (3) and (4) are significant in order to predict NLB (with *F*-value 60.68) and WCR (with *F*-value 129.69) respectively. In addition, Table 3 shows that the explanatory powers of both models are relatively high.

Table 3 suggests that WCR model (4) (with R square of 71.5%) has higher explanatory power than the explanatory power of NLB model (3) (with R square of 54%). This means that 54% of the variations in NLB and 71.5% of the variation in WCR is accounted for by the independent and control variables recognised in the regression model.

Table 3 -ANOVA Test Results

Variable	*P*-Value	*F*- Value	R Square	Number of observations
NLB	0.000***	60.680	54 %	370
WCR	0.000***	129.691	71.5 %	370
*** Significant at 0.01 level.				

Conclusions and Recommendations

Although financial managers spend considerable amount of their time to manage working capital, working capital management attracts less attention in the financial management literature than that for capital budgeting and capital structure. Nevertheless, several studies in recent times have noted working capital management as a sensitive area that needs special research attention. As a consequence, a number of studies have examined the sensitivity of corporate investments to liquidity. These studies have noted the complexity of the relationship between corporate investments and liquidity and show different relationships over industries and over different degrees of financial constraints.

This study uses Shulman and Cox's (1985) Net Liquidity Balance (NLB) and Working Capital Requirement (WCR) as a proxy for working capital. The study investigates the relationship between corporate investments and liquidity measured by NLB and WCR. The study uses 82 listed service firms (370 firm-years) in Stock Exchange in Thailand to examine the hypothesised relationships. Testing the hypotheses using a sample of firms from Thailand is considered appropriate as Thailand is an emerging market which has seen a greater need of liquidity as it undertakes corporate investments arising from growth opportunities.

The findings of the study support both hypotheses (H1 and H2) suggesting that there is a significant positive relationship between

corporate investments and NLB and that there a significant negative relationship between corporate investments and WCR. While the study strongly supports several previous studies, demonstrating the sensitivity of investments to liquidity, it more importantly contributes to the literature on working capital by showing the dual-role of working capital in relation to corporate investments. According to the findings of the study, it is highly likely that service firms in Thailand manage WCR efficiently, with the purpose of enhancing the level of NLB. A clear understanding of the two components of the working capital and their roles in relation to investments could help firms to gain benefits from growth opportunities. For instance, firms can improve cash balances through managing the two components of NWC when they undertake investments arising from growth opportunities of emerging markets such as Thailand, India and Taiwan.

While the findings of this study are applicable to all firms irrespective of the type of industry in general, they are more specifically applicable to management of working capital of service firms in emerging markets. Further, the regression models developed in the study may be useful to financial managers when estimating the levels of NLB and WCR for their firms. Although the models may not provide a 100% accurate estimations, they provide a benchmark level which would enable to avoid day to day costly interruptions of firm's operation, while undertaking investment opportunities.

Suggestions for Future Research

Although the study was conducted using all firms in service industry in Thailand, the findings may not be generalisable across all sectors in the service industry. A study must account for sector wise difference in order to make more accurate inferences about each sector. Further, the model can be improved by adding a control variable in order to increase the explanatory power. This study also can be replicated using a sample from a developed country as there might be differences between developed markets and emerging markets in terms of managing working capital. Also, future researchers may undertake a comparative study using the findings of this study.

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