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Working capital, cash holding, and profitability of restaurant firms

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ABSTRACT

Efficient working capital management is becoming important for restaurant firms coping with weak financial conditions and increased economic uncertainty. This study investigates the impact of restaurant firms' working capital on their profitability. We further examine the effects of firms' cash levels on the relationship between working capital and profitability. The findings ascertain a strong inverted U-shape relationship between working capital and a firm's profitability, which indicates the existence of an optimal working capital level for restaurant firms. This study also reveals that a firm's cash level is an important factor for efficient working capital management. The results suggest that interactive effects exist among working capital, cash levels, and profitability. Thus, restaurant managers should consider these different roles and impacts when developing an efficient working capital management strategy. Detailed results and implications are presented in the main body of this paper.

1. Introduction

The U.S. economy has shown many positive signs in the years since the National Bureau of Economic Research (NBER) declared the end of the 2007–2009 recession in June 2009. However, there are still significant drags hampering recovery, such as continued distress in the housing market and high unemployment rates. More importantly, economic policy uncertainty has increased in the U.S. and globally since the recession, which has negative effects for both firms and nations alike (Baker et al., 2012). In line with this increased economic uncertainty, between 1995 and 2010, U.S. corporations have been holding a record-high amount of cash (from $1.22 trillion to $4.97 trillion), with an annual growth rate of 10%. In 2011, cash holdings extended to nearly $5 trillion, more than any other year in history (Sánchez and Yurdagul, 2013).

Unlike other industries, the restaurant industry has not shown a similar upsurge in cash levels over the same period. Conversely, restaurant firms have very low (even negative) levels of working capital (.87% of sales in our sample) and very large accounts payable (the largest component of working capital; 4.78% of sales in our sample). This means that restaurant firms rely substantially on suppliers' credit for business operations. This may be because restaurant companies typically have limited capital resources and are financially constrained. Severe competition among restaurants also hinders increasing menu prices even in situations where commodity costs increase, which causes low operating margins and ultimately reduces internal financing. Accordingly, restaurant firms may be more vulnerable to unexpected economic turbulence than other industries. Indeed, according to Parsa et al. (2005) about 26% of restaurant firms fail during their first year of operation and 60% fail within three years. The main reasons for this high failure rate are limited resources and a lack of capital (Parsa et al., 2005).

In this respect, efficient working capital management is critical for a restaurant firm's ability to cope with weak financial conditions and increased economic uncertainty. Likewise, liquidity management (cash level management) is important for restaurant firms in good times and even more so in uncertain economic conditions. Insufficient current assets may impede a firm's ability to maintain efficient operations and further increase its risk of bankruptcy (Dunn and Cheatham, 1993). However, excessive liquidity can also be detrimental to a firm's profitability (Bhattacharya and Nicodano, 2001). Efficient working capital management means that management is able to plan and control a firm's current assets and liabilities to meet short-term obligations while at the same time avoiding excessive investment in short-term assets (Eljelly, 2004). Thus, it is important to note that a firm's profitability can be enhanced not only through efficient operations, but also by utilizing optimal working capital management. However, identifying and maintaining optimal working capital levels is not a simple task because the level of working capital differs based on economic conditions, as well as firm-specific factors, such as capital intensity, profitability, size, etc.

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A firm's working capital reflects its operating aspects (i.e., operating efficiency) and liquidity aspects (i.e., financial risks) simultaneously. In other words, operating and liquidity aspects are mingled within a working capital measurement. Therefore, if the two are not considered separately it is difficult to identify which aspect really influences restaurant firms' profitability. Previous empirical studies of other industries reveal this difficulty, suggesting that traditional working capital measures, including cash, accounts receivable, inventories, accounts payable, and current debts, disregard the interactive effects among the components of the working capital measure (Jose et al., 1996).

Therefore, this study is designed to overcome these difficulties and limitations by determining whether working capital influences restaurant firms' profitability. More specifically, the objectives of this study are (1) to investigate the impact of working capital on firms' profitability (ROA: return on assets); (2) to identify the optimal level of working capital for restaurant firms; and (3) to examine the moderating effect of firms' cash levels on the relationship between working capital and profitability (ROA). By fulfilling these objectives, this study provides a better understanding of the interactive effects among working capital components and reveals the non-linear relationship between firms' working capital and profitability. It should also be noted that, to our knowledge, this study is the first effort in either hospitality or finance academia that attempts to understand working capital management and cash holding interactively.

2. Literature review

2.1. Working capital management

Working capital is defined as the difference between current assets and current liabilities and is often used to measure a firm's liquidity level. The components of working capital are cash, accounts receivable, inventories, accounts payable, current debt, and the current portion of long-term debt. Recent researchers (e.g., Jose et al., 1996; Shin and Soenen, 1998; Deloof, 2003; Padachi, 2006; García-Teruel and Martínez-Solano, 2007; Raheman and Nasr, 2007) have studied the effects of a firm's working capital on its profitability with the Cash Conversion Cycle (CCC), which refers to how long it takes to convert accounts receivable, inventories, and accounts payable into cash, rather than traditional working capital measures. CCC reflects only a firm's operational side (e.g., accounts receivable, accounts payable, and inventories), while traditional working capital measures capture a firm's financial aspects as well (e.g., cash and current debts). In this way, researchers who use CCC examine the effects of the operational side of working capital on a firm's profitability.

Conceptually, a firm's Cash Conversion Cycle (CCC) indicates a firm's decisions regarding how much money to use for inventories and customers and how much credit to accept from suppliers because it represents the difference between when a firm collects payment from customers and when it pays suppliers. Generally, CCC can be considered as a proxy for the level of working capital management. Tighter control of a firm's CCC is viewed as better for operational efficiency.

Jose et al. (1996) examined the relationship between Cash Conversion Cycles (CCC) and firms' profitability in seven industry groups over a twenty-year period (1974–1993). They found that efficient working capital management (i.e., lower CCC) is associated with higher profitability in several industries (e.g., Natural Resources, Manufacturing, Service, Retail/Wholesale, and Professional Services) but not in all industries. Shin and Soenen (1998) also supported a strong negative relationship between a firm's net trading cycle, which is similar to CCC, and its profitability. In addition, they indicated that a shorter net trading cycle can cause higher stock returns, emphasizing the importance of efficient working capital management for creating shareholder value. García-Teruel and Martínez-Solano (2007) noted the particular importance of working capital management in small and medium-sized companies. Their study is meaningful to the restaurant industry since small and medium-sized firms are more financially constrained, similar to the average restaurant firm. Their findings are consistent with previous studies in terms of the relationship between CCC and profitability (Jose et al., 1996; Wang, 2002; García-Teruel and Martínez-Solano, 2007; Dong and Su, 2010; Baños-Caballero et al., 2014), whereas Deloof (2003), investigating 1009 large Belgian firms between 1992 and 1996, did not find a significant relationship between CCC and gross operating income.

Further, a low level of working capital may deteriorate a firm's operating performance (Blinder and Maccini, 1991). For example, if a firm maintains a low inventory level it will need to purchase small amounts frequently, which increases supply costs. Thus, the firm cannot obtain adequate discounts from suppliers. In such a situation, firms may also struggle with obtaining high and consistent quality raw ingredients. Further, it may be difficult for the firm to maintain sustainable profits because of unexpected potential business losses due to a scarcity of products (Blinder and Maccini, 1991). Similarly, Wang (2002) pointed out the trade-off effect; if a firm sets its inventory levels too low it may risk losing sales due to items being out of stock.

It is also well known that credit policies that are too tight or pay suppliers too slowly weaken relationships with customers and suppliers. A firm can achieve higher sales and strengthen its relationship with customers by offering generous credit policies (Long et al., 1993; Deloof and Jegers, 1996; Shah, 2009). Indeed, many credit card companies offer special promotions that encourage customers to spend more. In the restaurant industry, strong relationships with suppliers are important because food quality is critical for customer service. Suppliers may make an effort to collect cash early by offering discounts for early payment. Thus, paying cash by the due date or paying early is one way to maintain good relationships with suppliers. Thus, it is rational that accounts receivable (AR) levels that are too low and too much accounts payable (AP) impede a firm's operating performance.

Recently, Baños-Caballero et al. (2014) argued that there is an inverted U-shaped relationship between a firm's net trading cycle ((accounts receivable/sales) × 365 + (inventories/sales) × 365 − (accounts payable/sales) × 365) and its performance (Q = (market value of equity + book value of debt)/book value of asset). They suggested that a firm should increase investments in accounts receivable and inventories to increase sales when net trading cycles are too short. However, the effect of net trading cycles on corporate performance can turn negative at a certain point when the net trading cycle is too long. Thus, managers have to find and maintain an optimal level of accounts receivable, accounts payable, and inventories that can maximize the firm's value. This finding by Baños-Caballero et al. (2014) can be quite useful for the restaurant industry where many financially constrained restaurant firms have a low level of working capital, which may deteriorate operating performance.

Despite these findings, their study cannot capture the whole picture of working capital since it did not consider the firms' cash levels in the net trading cycle model. For instance, if firms maintain a lot of cash with short net trading cycles, the relationship between the firms' net trading cycles and performance will not be the same as firms holding small amounts of cash. Moreover, the market value of a firm is not only determined by business results using the firm's accounts receivable, accounts payable, and inventories. Instead it may be influenced by many other non-operational aspects, such as dividends, ownership, R&D, and financial market conditions. That

is, in order to fully capture the direct effects of operating aspects (i.e., operating efficiency) and liquidity aspects (i.e., financial risks) on firm performance, this study used working capital and operating profitability (ROA) rather than the net trading cycle (or Cash Conversion Cycle) and the market value of the firms.

Based on the above rationale we proposed that a non-linear relationship is more likely between a firm's working capital and profitability. Specifically, the relationship will be positive for firms with negative working capital and the relationship will be negative for firms with positive working capital in the restaurant industry. Reflecting the results of previous studies, such as Baños-Caballero et al. (2014), we hypothesized a curvilinear (i.e., inverted U-shaped) relationship between restaurant firms' working capital and profitability, suggesting the existence of an optimal working capital level.

Hypothesis 1. A restaurant firm's working capital (WC) and its profitability have an inverted U-shaped relationship.

Hypothesis 2. If a restaurant firm's working capital is positive, the firm's working capital will have a negative influence on its profitability (ROA).

Hypothesis 3. If a restaurant firm's working capital is negative, the firm's working capital will have a positive influence on its profitability (ROA).

2.2. Cash holdings

Firms' cash holding motives have received increased attention due to the recent growth of substantial cash holding by U.S. companies (Bates et al., 2009). Cash is the most liquid, but least profitable, asset. If economic conditions are good it is not wise to hold extra cash due to higher opportunity costs, while in the opposite situation it may be desirable to hold onto cash in order to be ready for potential risks caused by economic uncertainty. In short, cash is key to liquidity management.

The transaction cost theory explains that firms hold extra cash to reduce transaction costs (Keynes, 1934). If a firm does not have enough cash to pay its bills, it has to borrow money from external financial sources until it can convert non-cash assets into cash, which causes extra interest expenses and transaction costs. In general, smaller firms are more likely to hold extra cash than larger firms since smaller firms are exposed to more operating and financial risks (Opler et al., 1999; Kim et al., 1998; Fazzari and Petersen, 1993). In short, transaction costs vary with the amount of liquid assets held by a firm, the cost of raising external funds, the length of the Cash Conversion Cycle (CCC), and the financial strength of the firm (Opler et al., 1999). This precautionary motive explains holding extra cash as a provision for future investments (Bates et al., 2009; Han and Qiu, 2007; Almeida et al., 2004; Keynes, 1934). When a firm does not have enough cash or liquid assets, it increasingly risks giving up opportunities to invest in profitable projects. Thus, firms tend to hold extra cash when managers expect more investment opportunities in the near future. The transaction cost theory and precautionary motives explain firms' cash holding motives from different perspectives. However, the motives are along the same line: cash works as a buffer against the disadvantage of a liquidity shortage. Similarly, Campbell and Shiller (2001) and Irvine and Pontiff (2009) found that firms hold more liquid assets when cash flow volatility is high. Bates et al. (2009) investigated cash flow risks in U.S. companies between 1980 and 2006. They suggest that a firm's cash level increases when its cash flow becomes riskier (more volatile) and inventories and accounts receivable are diminished. Brown and Kapadia (2007) explained after examining newly listed firms that firms with higher idiosyncratic risk generate more liquid assets. From a practical perspective, Bates et al. (2009) revealed four important variables that explain changes in a firm's cash holdings: working capital, cash flow volatility, capital expenditures, and R&D expenditures.

The relationship between a firm's capability to generate cash from operations and the level of actual cash holdings is important to understanding a firm's working capital management. In particular, it is essential to the restaurant industry since many firms are financially constrained. Restaurant companies can convert non-cash working capital assets into cash more quickly than other industries, such as manufacturing or retail/wholesale. Therefore, restaurant firms do not need to hold extra cash to diminish opportunity costs if they are capable of generating internal cash from operations. Conversely, firms need additional cash to avoid the risk of unexpected cash shortfalls even though cash increases opportunity costs. In other words, restaurant firms' potential for generating internal cash can reduce the role of cash as a buffer against liquidity risk. Thus, it is possible to use a restaurant firm's cash level as a proxy for the capability of their operations to generate cash in the context of working capital management.

In this regard, if a restaurant firm maintains positive working capital with positive cash levels, it can be interpreted that the firm potentially has a poor capability of generating cash from operations. In such cases, the firm will attempt to hold and increase extra cash to avoid unexpected cash shortfalls. In other words, such firms pay more attention to cash rather than non-cash assets since cash is the most easily convertible and reliable asset. Therefore, when a firm has both positive working capital and positive cash levels its working capital will incur incremental opportunity costs as cash levels increase, which has a negative impact on profitability. Thus, the negative relationship between working capital and profitability, which was proposed in Hypothesis 2, will be steeper.

Conversely, a restaurant firm with positive working capital but negative cash levels signifies a positive level of non-cash asset (e.g., inventory) working capital. Such restaurant firms are expected to have a good capability of generating internal cash flows. That is, a negative cash level is not problematic because non-cash assets can be converted into cash quickly to pay off short-term debts. Such restaurant firms will hold more inventories and accounts receivable, or pay down accounts payable to increase operating performance, rather than hold more cash. Therefore, when a restaurant firm with positive working capital and a negative cash level decides to increase working capital, it increases non-cash assets rather than cash. As a result, the increased working capital will positively influence operating performance due to the benefit of suppliers' discounts, generous credit policies, and discounts for early payment. Thus, for a restaurant firm with positive working capital and a negative cash level, the negative relationship between working capital and profitability (Hypothesis 2) will improve as working capital increases. Therefore, we proposed that the level of cash plays a moderating role in the relationship between working capital and profitability as hypothesized below:

Hypothesis 4. If a restaurant firm's working capital is positive, the negative relationship between its working capital and profitability will significantly differ based on its level of cash (positive or negative).

Similarly, when a restaurant firm has negative working capital but a positive cash level the firm's operations have inefficient cash generating capabilities. Such restaurant firms should be cautious regarding holding inventories, maintaining tighter credit policies, or relying more on suppliers' credit due to high liquidity risks from incompetent cash generating capabilities. Consequently, if these firms can increase working capital it is more likely to increase their cash rather than non-cash assets. This increased cash will incur additional opportunity costs, which negatively impacts profitability. Therefore, for restaurant firms with negative working capital

and positive cash levels the positive relationship between working capital and profitability, which was proposed in Hypothesis 3, will diminish as working capital increases.

On the other hand, if a restaurant firm has negative working capital and a negative cash level the firm's operations may have either good or poor cash generating capabilities. First, when a firm has good internal cash generating capabilities it will try to maintain sufficient amounts of non-cash assets. If the firm can increase working capital it will increase non-cash assets rather than cash levels. That way, an increase in working capital will positively influence profitability. Therefore, the positive relationship between working capital and profitability, proposed in Hypothesis 3, will improve. However, if a restaurant firm has poor internal cash generating capabilities its business is in serious trouble, which means it will not be easy to increase working capital. We believe that if a firm faces this type of situation, with negative working capital, negative cash levels, and poor internal cash generating capabilities, it will be difficult to survive in the competitive restaurant industry. Therefore, we do not need to consider firms in this category when investigating the relationship between working capital and profitability. Thus, based on the above rationales for restaurant firms with negative working capital, we hypothesized the following:

Hypothesis 5. If a restaurant firm's working capital is negative, the positive relationship between its working capital and profitability will significantly differ based on its cash level (positive or negative).

3. Methodology

3.1. Samples and data

This study uses U.S. restaurant companies' financial data from the COMPUSTAT database with a Standard Industry Code (SIC) of 5812 for the years 1963–2012. We excluded firms with serious missing data. To minimize the effect of outliers, we dropped 1% of the extreme ROA (return on assets), WCR (working capital/total revenue), CCR ((accounts receivable + inventories – accounts payable)/total revenue), CASHR (cash and cash equivalent – current debts)/total revenue), AT (total assets), REVT (total revenue), and GROWTH (sales growth rate) values. As a result, 362 firm-year panel data (28 firms) were dropped from the sample. Thus, the sample for analysis was 3238 firm-year panel data for 298 firms.

3.2. Variables

To measure firm performance, return on assets (ROA) is used in this study as a dependent variable. ROA is calculated as earnings before interest, taxes, depreciation, and amortization (EBITDA) divided by total assets. In this study, we investigated the changes in operating performance within companies and the industry in accordance with the firms' working capital levels. In other words, we are interested in the actual direct impact of firms' levels of accounts receivable, inventories, accounts payable, cash, and current debts on operating performance rather than the market's expectations of their effects on firm value. For restaurant firms, depreciation and interest are a large portion of expenses and can vary considerably among firms or from year to year within a company. Thus, EBITDA provides a better comparison of core operating performance and a better fit for the purpose of this study since it removes the impact of interest and depreciation expenses.

Working capital rate (WCR) is an independent variable and is measured by working capital over sales. The other independent variables include accounts receivable rate (ARR), which is accounts receivable over sales, inventories rate (INVR), calculated as the ratio of inventories over sales, and accounts payable rate (APR), which is the ratio of accounts payable to sales.

To examine the impact of WCR on restaurant performance, we divided the restaurant firms into two groups based on their WCR. We did this for two reasons. First, the restaurant firms showed a wide range of WCR (−30% to 56%), and we noted a potential non-linear relationship between a firm's working capital and profitability. Second, in previous studies there are two views of working capital management. One is the traditional view that higher working capital allows a firm to increase its sales, profits, and, ultimately, its value. The other view is that higher working capital requires a firm to have higher financing expenses, which causes the firm to be less profitable because excessive working capital may require the firm to invest in less profitable businesses. Thus, we believe that it is not reasonable to examine all restaurant firms together without considering the firms' positive and negative working capital levels. Positive working capital firms hold additional current assets (cash, non-cash, or both) beyond current debts, while the negative working capital firms maintain working capital (cash, non-cash, or both) that is less than its current debts.

Working capital (cash + cash equivalent – current debts + accounts receivable + inventories – accounts payable) consists of two parts: cash assets (cash + cash equivalent – current debts) and non-cash assets (accounts receivable + inventories – accounts payable). In this study, we used the cash level (Cash Level) (meaning CASHR, which is (cash + cash equivalent – current debts)/total revenue) as a proxy for the firm's cash holding level. For non-cash assets, we used CCR ((accounts receivable + inventories – accounts payable)/total revenue) instead of CCC since CCR is a similar concept and basically equal to the Cash Conversion Cycle (CCC) except that all three components are a percentage of sales.

For further analysis, we used Cash Level and WCR (Cash Level*WCR) as interaction terms in the GMM models after dividing the restaurant firms into two segments: positive working capital and negative working capital. We added the interaction terms (Cash Level and WCR) to identify the moderating effect of Cash Level on the relationship between WCR and ROA. A dummy variable was used for Cash Level: 1 for positive Cash Level and 0 for negative Cash Level.

For control variables, we used firm size (SIZE) as the logarithm of total assets, sales growth (GROWTH) as the sales amount difference from the previous year divided by the sales of the previous year $((Sales_n - Sales_{n-1})/Sales_{n-1})$ and leverage (LEV) as total liabilities divided by total assets $(total\ liabilities_n/total\ assets_n)$. Furthermore, since economic conditions affect a firm's performance we used annual GDP growth rate (GDP) calculated as $((GDP_n - GDP_{n-1})/GDP_{n-1})$ as a control variable. All the above variables are expected to have an effect on firms' operating performances and are related to working capital management.

The Variance Inflation Factor (VIF) was checked for each independent variable to ensure that there was no serious multicollinearity in the analysis. Since the VIF was not greater than 2 for any variables, we concluded that a multicollinearity problem does not exist in the models.

3.3. Statistical analysis

This study used the ordinary least-squares regression model (OLS) for analysis as in Eq. (1). In addition to the OLS model, this study provides the results of additional analysis models to assure our findings are robust. The 2nd model used the First-difference panel data method to eliminate a time-constant unobserved effect and to obtain causal effects (Wooldridge, 1995/2002). The First-difference method is a simple difference equation (Eq. (2)) in which changes in Y are regressed on changes in X's variables. The benefit of using First-difference panel model analyses is that it removes

the effects (latent heterogeneity) caused by omitted time invariant variables from the models that may cause biased estimation in OLS regression.

To remove the potential influence of serially correlated errors, this study applied a Fixed-effects panel model using Eq. (3). We performed a Hausman test to determine the exogeneity of the unobserved errors and choose between Fixed-effects and Random-effects models. Since the null hypothesis of the Hausman test was rejected, we concluded that the Random-effects model was inconsistent and the Fixed-effects model was preferred. However, when errors $\varepsilon_{i,t}$ are serially correlated the First-difference method is more efficient than the Fixed-effects model, whereas if errors $\varepsilon_{i,t}$ are not serially correlated the Fixed-effects model is more efficient than the First-difference method. Wooldridge (1995/2002) suggested that it is useful to report both sets of results and compare the differences. Thus, we conducted both First-difference and Fixed-effects panel data analyses.

Further, to control for endogeneity, which could seriously affect the estimation results, this study applied Arellano–Bond's (1991) two-step Generalized Method of Moments (GMM) approach using Eq. (4). The endogeneity issue occurs when an independent variable is correlated with errors $\varepsilon_{i,t}$, which is often caused by omitted variables, measurement errors, or simultaneity between dependent variables and independent variables. The most efficient way to deal with endogeneity is developing proper instrumental variables, which have strong correlation with indogenous independent variables but are not correlated with errors. A lagged regressor can be used as an instrument and the lagged differences of all the independent variables can also be used as instruments to avoid exogenous issues (Arellano and Bond, 1991). However, Arellano–Bond's (1991) two-step Generalized Method of Moments (GMM) can suffer from severe finite sample bias if a number of lagged instrument variables are weakly correlated with endogenous independent variables. Therefore, we used Windmeijer's (2005) bias-corrected robust standard errors for the two-step GMM estimator and tested for autocorrelation in first-differenced errors. In all cases (OLS regression, First-difference, Fixed-effects, and GMM models), the robust standard errors were used to obtain heteroskedasticity–robust estimators. The following are the models used for analyses:

OLS regression model

$$ROA = \beta_0 + \beta_1 * \mathrm{WCR} + \beta_2 * \mathrm{WCR}^2 + \beta_3 * \mathrm{SIZE} + \beta_4 * \mathrm{GROWTH} + \beta_5 * \mathrm{GDP} + \beta_6 * \mathrm{LEV} + \varepsilon \quad (1)$$

First-difference model

$$\Delta\mathrm{ROA}_{i,t} = \beta_1 * \Delta\mathrm{WCR}_{i,t} + \beta_2 * \Delta\mathrm{WCR}^2_{i,t} + \beta_3 * \Delta\mathrm{SIZE}_{i,t} + \beta_4 * \Delta\mathrm{GROWTH}_{i,t} + \beta_5 * \Delta\mathrm{GDP}_t + \beta_6 * \Delta\mathrm{LEV}_{i,t} + \Delta\varepsilon_{i,t} \quad (2)$$

Fixed-effects model

$$\mathrm{ROA}_{i,t} = \beta_0 + \beta_1 * \mathrm{WCR}_{i,t} + \beta_2 * \mathrm{WCR}^2_{i,t} + \beta_3 * \mathrm{SIZE}_{i,t} + \beta_4 * \mathrm{GROWTH}_{i,t} + \beta_5 * \mathrm{GDP}_t + \beta_6 * \mathrm{LEV}_{i,t} + a_i + \varepsilon_{i,t} \quad (3)$$

GMM model

$$\mathrm{ROA}_{i,t} = \beta_0 + \beta_1 * \mathrm{ROA}_{i,t-1} + \beta_2 * \mathrm{WCR}_{i,t} + \beta_3 * \mathrm{WCR}^2_{i,t} + \beta_4 * \mathrm{SIZE}_{i,t} + \beta_5 * \mathrm{GROWTH}_{i,t} + \beta_6 * \mathrm{GDP}_t + \beta_7 * \mathrm{LEV}_{i,t} + a_i + \varepsilon_{i,t}$$

Instruments for differenced variables : GMM type : $ROA_{i,t-1}$ (4)

Standard : $\Delta\mathrm{WCR}_{i,t}$, $\Delta\mathrm{SIZE}_{i,t}$, $\Delta\mathrm{GROWTH}_{i,t}$, $\Delta\mathrm{GDP}_t$, $\Delta\mathrm{LEV}_{i,t}$

4. Results

4.1. Descriptive statistics

Table 1 shows the descriptive information for restaurant firms within the two main sub-groups: positive and negative WCR groups. On average, U.S. restaurant firms show negative CASHR (−0.2%). As shown in Fig. 1, cash holdings continued to decrease after 1963 in the restaurant industry. Overall, restaurant firms' ROA

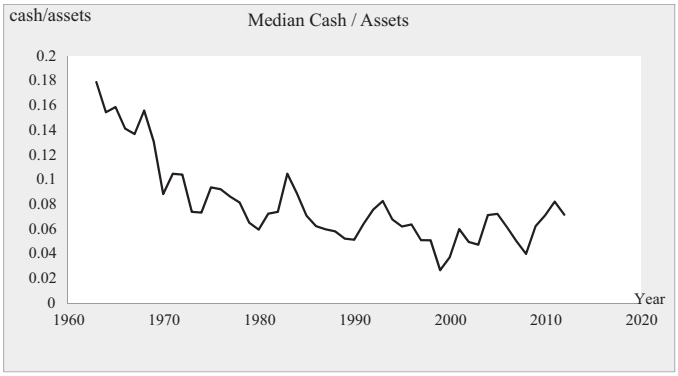

Fig. 1. Restaurant firms' cash to assets ratio between 1963 and 2012.

was 15.3% and WCR was 0.9%. However, the ROA did not differ substantially between the positive WCR group (16.0%) and the negative WCR group (14.7%).

For both the positive and negative WCR groups, APR (5.0% in positive and 4.6% in negative WCR groups) was the highest figure among the three main components of CCR (ARR, INVR, and APR), which reveals that restaurant firms rely heavily on trade credits from their suppliers. Interestingly, among the WCR components CASHR showed the biggest difference between the two groups, which was 4.3% for the positive WCR group and −4.9% for the negative WCR group. Further, the positive WCR group had a higher sales growth rate (19.3%) than the negative WCR group (12.3%). In Table 1, the larger firms show higher LEV (the ratio of total liabilities to total assets) and lower Cash Levels than smaller firms. These findings are consistent with previous empirical studies (e.g., Opler et al., 1999; Kim et al., 1998; Fazzari and Petersen, 1993), which found that smaller firms have more constraints to obtaining outside financing and, thus, hold more cash.

To understand the importance of the firms' cash levels, we divided the main two groups (positive WCR and negative WCR) into two additional sub-groups according to their cash levels (positive and negative Cash Level sub-groups). As presented in Table 2, the mean ROAs of the sub-groups for the positive WCR group did not significantly differ (16.1% for the positive Cash Level group and 15.5% for the negative Cash Level group), even though each group's mean CASHR (7.2% for the positive Cash Level group and −3.6% for the negative Cash Level group) and CCR (1.2% in the positive Cash Level group and 6.7% in the negative Cash Level group) varied quite a bit. The firms with positive CASHR showed higher ROA (16.1%), WCR (8.3%), and GROWTH (20.2%). but lower CCR (1.2%) and LEV (43.9%), than firms with negative cash levels (ROA: 15.5%, WCR: 3.2%, GROWTH: 16.7%, CCR: 6.7%, and LEV: 58.1%).

Table 1
Overall descriptive information for restaurant firms based on positive and negative WCR.

		ROA	WCR	CASHR	CCR	ARR	INVR	APR	AT	REV	GROWTH	LEV
Overall – Obs (3238)	Mean	.1532	.0087	−.0022	.0110	.0319	.0268	.0478	322	456	.1583	.5260
	Std. dev.	.0878	.0890	.0829	.0415	.0340	.0231	.0270	783	1104	.2687	.2049
	Min.	−.3065	−.2995	−.28	−.08	.0001	.0004	.0013	1.8	2.56	−.38	.0851
	Max.	.3724	.5575	.52	.28	.3245	.2658	.3687	9175	10,963	2.23	.9994
Positive WCR – Obs (1639)	Mean	.1596	.0697	.0430	.0267	.0423	.0341	.0497	247	344	.1927	.4767
	Std. dev.	.0863	.0796	.0874	.0473	.0397	.0309	.0306	586	823	.2834	.1962
	Min.	−.2510	0	−.28	−.08	.0001	.0004	.0013	1.8	2.61	−.38	.0851
	Max.	.3724	.5575	.52	.28	.3245	.2658	.3687	6386	10,707	2.23	.9973
Negative WCR – Obs (1599)	Mean	.1467	−.0537	−.0485	−.0052	.0213	.0193	.0458	399	570	.1229	.5766
	Std. dev.	.0888	.0428	.0430	.0261	.0225	.0136	.0225	938	1322	.2480	.2013
	Min.	−.3065	−.2995	−.28	−.08	.0003	.0020	.0058	1.8	2.56	−.37	.1046
	Max.	.3688	−.0002	.06	.19	.2392	.1412	.2789	9175	10,963	2.2	.9994

Note: ROA = return on assets; WCR = working capital/sales; CASHR = (cash + cash equivalent − short term liabilities)/sales; CCR = (accounts receivable + inventories − accounts payable)/sales; ARR = accounts receivable/sales; INVR = inventories/sales; APR = accounts payable/sales; AT = total assets (million dollars); REV = total sales (million dollars); GROWTH = $(sales_n - sales_{n-1})/sales_{n-1}$; LEV = total liabilities/total assets; Obs = number of observations.

Similarly, for the negative WCR group, the sub-groups' mean ROAs (16.2% for the positive Cash Level group and 14.5% for the negative Cash Level group) did not significantly differ. Further, mean CASHR (−5.5% for the positive Cash Level group and 0.9% for the negative Cash Level group) and CCR (−2.4% for the positive Cash Level group and −.3% for the negative Cash Level group) did not vary much compared to the positive WCR group. The firms with positive cash levels showed higher ROA (16.2%), WCR (−1.6%), and GROWTH (21.8%) but lower CCR (−2.4%) and LEV (50.6%) than firms with negative cash levels (ROA: 14.5%, WCR: −5.8%, GROWTH: 11.2%, CCR: −.3%, and LEV: 58.5%).

Interestingly, restaurant firms had the highest ROA (16.2%) and GROWTH (21.8%) when they had negative WCR (−1.6%) and positive cash levels. In contrast, the firms with both a negative WCR (−5.8%) and negative cash levels showed the lowest ROA (14.5%) and GROWTH (11.2%).

4.2. Pearson correlation analysis

The correlations between variables are presented in Tables 3 and 4. As presented in Table 3, for all samples in this study there were significant positive relationships between WCR and ROA (.058). Among WCR components, only CASHR (.070) was significantly positively related to ROA, while ARR (−.147), INVR (−.055), and APR (−.212) were significantly negatively related to ROA. Interestingly, however, CCR (−.015) did not show a significant relationship with ROA due to the trade-off effects among WCR components. All components of WCR were significantly positively related to WCR, but CASHR (.886) had the strongest relationship and APR (.062) had the weakest relationship. As for the other control variables, AT (.104), REV (.142), and GROWTH (.105) were positively related to ROA, while LEV (−.239) was negatively related to ROA. WCR was negatively related to AT (−.073), REV (−.093), and LEV (−.340), but positively related to GROWTH (.209). Similarly, CASHR was negatively related to AT (−.119), REV (−.151), and LEV (−.391), but positively related to GROWTH (.228).

In Table 4, the figures in the upper triangle stand for the negative WCR group, while those in the lower triangle represent the positive WCR group. The results reveal that there was a negative relationship between WCR and ROA in the positive WCR group (−.114) but a positive relationship in the negative WCR group (.241), which suggests a non-linear relationship between restaurant firms' WCR and ROA. In both groups, WCR (−.114 in the positive WCR group and .241 in the negative WCR group) had a stronger coefficient with ROA than CCR (−.103 in the positive WCR group and −.047 in the negative WCR group). Further, CASHR had the strongest positive relationship with WCR among its components.

Yet, WCR (−.114) and CCR (−.103) showed similarly negative associations with ROA in the positive WCR group, while WCR (.241) and CASHR (.210) showed similarly positive associations with ROA

Table 2
Descriptive information for restaurant firms based on positive and negative Cash Levels.

			ROA	WCR	CASHR	CCR	ARR	INVR	APR	AT	REV	GROWTH	LEV
Positive working capital	Positive Cash Level – Obs (1201)	Mean	.1614	.0834	.0716	.0120	.0341	.0274	.0495	212	259	.2021	.4386
		Std. dev.	.0870	.0865	.0834	.0364	.0336	.0239	.0295	554	593	.2914	.1893
		Min	−.2510	0	0	−.08	.0001	.0004	.0013	1.8	2.61	−.36	.0851
		Max	.3724	.5575	.52	.23	.2380	.2658	.2044	6386	10,707	2.23	.9973
	Negative Cash Level – Obs (438)	Mean	.1548	.0319	−.0356	.0672	.0649	.0526	.0502	343	577	.1671	.5812
		Std. dev.	.0841	.0356	.0324	.0500	.0457	.0394	.0337	656	1225	.2586	.1762
		Min	−.2016	0	−.28	.01	.0015	.0011	.0031	1.8	3.84	−.38	.1582
		Max	.3564	.2073	−.01	.28	.3245	.2632	.3687	5577	9775	1.8	.9922
Negative working capital	Positive Cash Level – Obs (166)	Mean	.1623	−.0155	.0089	−.0239	.0170	.0165	.0572	170	248	.2181	.5058
		Std. dev.	.0922	.0120	.0109	.0165	.0150	.0100	.0220	354	467	.2714	.1894
		Min	−.2057	−.0528	0	−.08	.0004	.0038	.0147	2.16	4.5	−.24	.1046
		Max	.3688	−.0003	.06	0	.0799	.0649	.1148	2354	4235	1.62	.9795
	Negative Cash Level – Obs (1433)	Mean	.1449	−.0581	−.0552	−.0031	.0218	.0196	.0445	426	608	.1119	.5849
		Std. dev.	.0883	.0429	.0403	.0261	.0232	.0139	.0223	980	1383	.2429	.2011
		Min	−.3065	−.2995	−.28	−.08	.0003	.0020	.0058	1.8	2.56	−.37	.1428
		Max	.3652	−.0002	−.01	.19	.2392	.1412	.2789	9175	10,963	2.20	.9994

Note: ROA = return on assets; WCR = working capital/sales; CASHR = (cash + cash equivalent − short term liabilities)/sales; CCR = (accounts receivable + inventories − accounts payable)/sales; ARR = accounts receivable/sales; INVR = inventories/sales; APR = accounts payable/sales; AT = total assets (million dollars); REV = total sales (million dollars); GROWTH = $(sales_n - sales_{n-1})/sales_{n-1}$; LEV = total liabilities/total assets; Obs = number of observations; Positive Cash Level = positive CASHR group; Negative Cash Level = negative CASHR group.

Table 3
Pearson's correlations for all samples.

	ROA	WCR	CASHR	CCR	ARR	INVR	APR	AT	REV	GROWTH	GDP	LEV
ROA	1											
WCR	.058***	1										
CASHR	.070***	.886***	1									
CCR	−.015	.376***	−.094***	1								
ARR	−.147***	.316***	.010***	.658***	1							
INVR	−.055***	.260***	−.070**	.695***	.319***	1						
APR	−.212***	.062***	.090***	−.052***	.543***	.262***	1					
AT	.104***	−.073***	−.119***	.082***	.084***	.006	−.015	1				
REV	.142***	−.093***	−.151***	.103***	.061***	.041**	−.043**	.919***	1			
GROWTH	.105***	.209***	.228***	−.004	.054***	.057***	.130***	−.079***	−.089***	1		
GDP	.008	.033	.040**	−.009	.013	.043**	.070***	−.102***	−.100***	.098***	1	
LEV	−.239***	−.340***	−.391***	.051***	.171***	.033*	.167***	.147***	.146***	−.189***	−.064***	1

Note: ROA = return on assets; WCR = working capital/sales; WCRsq = WCR$\hat{2}$; CASHR = (cash + cash equivalent − short term liabilities)/sales; CCR = (accounts receivable + inventories − accounts payable)/sales; ARR = accounts receivable/sales; INVR = inventories/sales; APR = accounts payable/sales; AT = total assets (million dollars); REV = total sales (million dollars); GROWTH = $(sales_n - sales_{n-1})/sales_{n-1}$; GDP = annual GDP growth rate; LEV = total liabilities/total assets.
* Significant at 10%.
** Significant at 5%.*** Significant at 1%.

in the negative WCR group. Thus, the relationship between WCR and ROA may differ based on CASHR in the positive WCR group but differs based on CCR in the negative WCR group. Another interesting finding is that the coefficients between ARR, INVR, APR, and ROA are all negative in both the positive and negative WCR groups.

In the positive WCR group, the firms' revenue (REV) and leverage (LEV) revealed negative coefficients (−.082 and −.274, respectively) but sales growth (GROWTH) had a positive coefficient (.219) with WCR. Similarly, in the negative WCR group, firms' leverage (LEV) had a negative coefficient (−.222), but sales growth (GROWTH) showed a positive coefficient (.064) with WCR. The results indicate that a firm's level of working capital is significantly negatively influenced by financial leverage but positively influenced by sales growth.

4.3. Analyses results

Table 5 presents the results of OLS, First-difference, Fixed-effects, and GMM regression analyses to investigate the relationship between WCR and ROA using Eqs. (1)–(4). Each model with WCR^2 tests the effect of the square term of WCR on profitability (ROA) to investigate the curvilinear relationship between WCR and ROA as presented in Hypothesis 1. The results of all of the WCR^2 models showed a significant inverted U-shaped relationship between WCR and ROA, which supports Hypothesis 1. Using a partial differentiation in terms of WCR, we calculated the optimal point to maximize profitability for all models. The results showed that a firm can reach an optimal point where working capital is 5.3% of sales in OLS, 5.9% of sales in First-difference, 12.4% of sales in Fixed-effects, and 4% of sales in the GMM models. As presented in

Table 4
Pearson's correlation coefficient matrix by positive and negative WCR.

+ \ −	ROA	WCR	CASHR	CCR	ARR	INVR	APR	AT	REV	GROWTH	GDP	LEV
ROA	1	.241***	.210***	.047*	-.147***	-0.018	-.214***	.157***	.180***	.101**	-0.034	-.220***
WCR	-.114***	1	.816***	.304***	.110***	.151***	-.144***	-0.006	0.019	.064**	-0.03	-.222***
CASHR	-.047***	.844***	1	-.296***	-.204***	-.126***	.065***	-.116***	-.122***	.098***	0.032	-.222***
CCR	-.103***	.124***	-.427***	1	.512***	.458***	-.348***	.183***	.235***	-.053**	-.107***	-.000
ARR	-.209**	.160***	-.204***	.646***	1	.127***	.484***	.101***	.098***	0.025	-0.025	.138***
INVR	-.118***	.065***	-.327**	.710***	.282***	1	.200***	.117***	.171***	0.022	0.018	.051**
APR	-.227***	.079***	.061**	0.016	.581***	.277***	1	-0.041	-.070***	.101***	.107***	.166***
AT	.047*	-0.012	-.075***	.119***	.170***	-0.006	0.029	1	.937***	-.054**	-.119***	.090***
REV	.112***	-.082***	-.144***	.127***	.123***	0.037	-0.002	.869***	1	-.067***	-.131***	.092***
GROWTH	.094***	.219***	.237***	-.065***	0.01	0.02	.136***	-.094***	-.098***	1	.105***	-.132***
GDP	0.036	-0.019	-0.013	-0.009	-0.003	0.026	0.039	-.075***	-.051**	.078***	1	-.109***
LEV	-.237***	-.274***	-.393***	.262***	.357***	.153***	.213***	.196***	.188***	-.192***	0.005	1

Note: Figures for negative WCR group is in the upper triangle; figures for positive WCR group is in the lower triangle; ROA = return on assets; WCR = working capital/sales; CASHR = (cash + cash equivalent − short term liabilities)/sales; CCR = (accounts receivable + inventories − accounts payable)/sales; ARR = accounts receivable/sales; INVR = inventories/sales; APR = accounts payable/sales; AT = total assets (million dollars); REV = total sales (million dollars); GROWTH = $(sales_n - sales_{n-1})/sales_{n-1}$; GDP = annual GDP growth rate; LEV = total liabilities/total assets.
* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

Table 5
The analyses of the relationship between working capital and profitability.

Dependent variable: ROA	OLS	First-difference	Fixed-effects	GMM
(Independent variables)				
WCR	.0844***	.0420*	.0844**	.0322
WCR^2	−.7818***	−.3551***	−.3417**	−.4017***
SIZE	.0136***	−.0487***	−.0063**	−.0144***
Growth	.0310***	.0361***	.0222***	.0343***
GDP	.0004	.0015***	.0003	.0005
Leverage	−.0995***	−.1235***	−.0698***	−.0792***
Observation	3238	2826	3238	2481
R^2	.16	.14	.08	N/A
Arellano–Bond				
1st order				−5.2183***
2nd order				−.10432

Note: Dependent variable is ROA = return on assets; WCR = working capital/sales; SIZE = log of assets; GROWTH = $(sales_n - sales_{n-1})/sales_{n-1}$; GDP = annual GDP growth rate; Leverage = total liabilities/total assets; Observation = number of firm's year.
* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

Table 6
The analyses of the relationship between working capital (positive and negative) and profitability.

Dependent variable: ROA	OLS		First-difference		Fixed-effects		GMM	
	Positive working capital	Negative working capital	Positive working capital	Negative working capital	Positive working capital	Negative working capital	Positive working capital	Negative working capital
(Independent variables)								
WCR	−.2367***	.3655***	−.0791***	.1327**	−.0981**	.1947***	−.1058***	.1496**
SIZE	.0128***	.0149***	−.0465***	−.0479***	−.0067**	−.0100**	−.0123***	−.0221***
Growth	.0283***	.0332***	.0360***	.0364***	.0188**	.0322***	.0336***	.0435***
GDP	.0016*	−.0005	.0020***	.0009	.0008	−.0004	.0014***	.0001
Leverage	−.1369***	−.0666***	−.1241***	−.1405***	−.1226***	−.0298	−.1564***	−.0806***
Observation	1639	1599	1203	1143	1639	1599	1050	1028
R^2	.16	.18	.17	.12	.12	.06	N/A	N/A
Arellano–Bond								
1st order							−2.2905**	−3.3849***
2nd order							.62639	−.99,932

Note: Dependent variable is ROA = return on assets; WCR = working capital/sales; SIZE = log of assets; GROWTH = $(sales_n - sales_{n-1})/sales_{n-1}$; GDP = annual GDP growth rate; Leverage = total liabilities/total assets; Observation = number of firm's year.
* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

Table 5, firm size (SIZE: −.0487 in First-difference, −.0063 in Fixed-effects, and −.0144 in GMM) and leverage (Leverage: −.1235 in First-difference, −.0698 in Fixed-effects, and −.0792 in GMM) had significant negative impacts, but sales growth (GROWTH: .0361 in First-difference, −.0222 in Fixed-effects, and .0343 in GMM) had a significant positive influence on ROA. Overall, the results indicated that the relationship between WCR and ROA is an inverted-U shaped (Hypothesis 1) with optimal working capital levels.

Further, two other models (one for the positive working capital group and the other for the negative working capital group) were also examined separately to identify the unique relationship patterns of the two groups. As presented in Table 6, for the positive working capital group the coefficients of ROA on WCR for all models were significantly negative, supporting Hypothesis 2. In contrast, the coefficients of ROA on WCR were all significantly positive for the negative working capital group, which supports Hypothesis 3. One noticeable finding is that the magnitudes of the coefficients of WCR in the negative WCR group are bigger than those in the positive WCR group. This finding implies that working capital improved profitability significantly faster for the negative WCR group than it deteriorated profitability for the positive WCR group.

Based on the results of serial correlation tests on the GMM models presented in Tables 5 and 6, we confirmed that the instrument

Table 7
Interaction effects of WCR and Cash Level in the GMM model.

Dependent variable: ROA	GMM Positive working capital	GMM Negative working capital
WCR	.0451	.1787***
Cash Level (dummy)	.0095**	−.0155*
WCR*Cash Level (dummy)	−.1674*	.3083
SIZE	−.0123***	−.0229***
Growth	.0334***	.0463***
GDP	.0013	.0002
Leverage	−.1563***	−.0813***
Observation	1050	1028
Arellano–Bond		
1st order	−2.2486**	−3.4243***
2nd order	.6238	−1.0998

Note: Dependent variable is ROA = return on assets; WCR = working capital/sales; Cash Level (dummy) is dummy variable (1 for positive and 0 for negative); WCR*Cash Level (dummy) is interaction term; SIZE = log of assets; GROWTH = $(sales_n - sales_{n-1})/sales_{n-1}$; GDP = annual GDP growth rate; Leverage = total liabilities/total assets; Observation = number of firm's year.
* Significant at 10%.
** Significant at 5%.
*** Significant at 1%.

Table 8
The relationship between WCR and ROA according to Cash Level in the GMM model.

Dependent variable: ROA	GMM	Positive working capital group	
	Overall	Positive Cash Level group	Negative Cash Level group
WCR	−.1058***	−.1086***	.0521
SIZE	−.0123***	−.0104**	−.0110
Growth	.0336***	.0361***	.0622***
GDP	.0014***	.0012**	.0000
Leverage	−.1564***	−.1309***	−.2455***
Observation	1050	609	249
Arellano–Bond			
1st order	−2.291**	−.1281	−1.996**
2nd order	.6264	.7061	−.4953

Note: Dependent variable is ROA = return on assets; WCR = working capital/sales; Cash Level is (cash + cash equivalent-current debt)/total revenue; SIZE = log of assets; GROWTH = $(sales_n - sales_{n-1})/sales_{n-1}$; GDP = annual GDP growth rate; Leverage = total liabilities/total assets; Observation = number of firm's year.
** Significant at 5%.
*** Significant at 1%.

variables are valid and the models are correctly specified since we could not reject the null hypothesis of no serial correlation at 2nd the order for any of the models. Therefore, the instrumental variables are not correlated with errors in the GMM models and provide the most robust results regarding endogeneity issues, which cannot be controlled by OLS, First-difference, or Fixed-effects models. In this regard, we can consider the results of the GMM model as the most robust among the models used in this study.

In order to test whether a firm's cash level (Cash Level) plays a moderating role in the relationship between WCR and ROA, we added an interaction term to the GMM model as shown in Table 7. As explained earlier, Cash Level is a dummy variable: 1 for positive cash levels and 0 for negative cash levels. Table 7 presents a significant negative interaction effect on the relationship between WCR and ROA for firms with positive working capital (WCR*Cash Level: −.1674). In other words, if a firm has positive working capital increasing cash levels (Cash Level) negatively impacts the relationship between WCR and ROA. The results support Hypothesis 4, confirming that Cash Level plays a moderating role in the relationship between WCR and ROA for firms with positive working capital. For firms with negative working capital, this study found no significant interaction terms. Thus, the results of this study did not support Hypothesis 5, suggesting that Cash Level does not play a moderating role in the relationship between WCR and ROA for firms with negative working capital.

In order to fully understand the moderating role of Cash Level, this study further examined cash levels (positive and negative cash levels) in the positive WCR group, which turned out to have a significant role as shown in Table 7. As presented in Table 8, the coefficient of WCR for all positive WCR groups is −.1058, which means that if a firm increases WCR by one unit its ROA would be reduced by .1058. Similarly, for firms in the positive Cash Level group, the coefficient of WCR is −.1086, which revealed a slight decrease when compared to the overall positive WCR group. This result supports our explanation of Hypothesis 4 in that an increase in working capital for firms with positive working capital and positive cash levels generates additional opportunity costs due to the increased cash levels, which negatively influence profitability. However, when firms' Cash Levels are negative in the positive WCR group, the coefficient of WCR is positive (.0521) but not significant. These results support our claim that the negative relationship between working capital and profitability for restaurant firms with positive working capital and negative cash levels will improve as working capital increases. Therefore, as presented in Table 8, this step of the analysis provides additional information to support the rationales for Hypothesis 4.

5. Conclusions

5.1. Summary and discussion

This study examined how restaurant firms' working capital influences operating profitability. Overall, this study revealed that working capital has a significant inverted-U shaped relationship (Hypothesis 1) with profitability (ROA). More specifically, an increase in working capital has a negative effect on profitability in firms with positive working capital (Hypothesis 2) and a positive impact on profitability in firms with negative working capital (Hypothesis 3). These findings were consistent with Baños-Caballero et al.'s (2014) work, which suggested that an optimal working capital level exists for firm performance. The result of this study suggests that the most optimal working capital rate is 4% of sales based on GMM estimators. The GMM models allowed us to control potential endogeneity issues and provide the most robust results. The results implied that restaurant firms had to manage their working capital very tightly since their optimal working capital rate is very close to zero.

Further, this study attempted to examine the interactive role of cash levels on the relationship between a firm's working capital and operating performance. In traditional working capital measurements the role of cash level is not considered as important as other working capital components. Further, firms' cash levels have been ignored in recent Cash Conversion Cycle (CCC) studies. However, this study revealed that firms' cash levels have a moderating effect in firms with positive working capital. Specifically, if firms have both positive cash levels and positive working capitals, the working capital will have a negative impact on operating profit. On the other hand, if firms have negative cash levels but positive working capital, the working capital will not have a negative impact on operating profit. Therefore, a firm's cash level was the most important indicator of efficient working capital management in firms with positive working capital. For these firms, a positive cash level implies inefficient cash generating capabilities but negative cash levels imply efficient cash generating capabilities.

Although firms holding negative cash levels with negative working capital showed higher ROAs than firms holding positive cash levels with negative working capital, the moderating effects of cash level were not identified in negative working capital firms. The results imply that when firms do not have enough working capital the financial aspects (Cash Level), the operational aspects (CCR), or both will negatively influence the operating performance. Consequently, it can be argued that negative working capital can be more detrimental than the positive working capital for restaurant firms' operating performance. The argument is supported by the steeper

slope of the WCR in the negative working capital group than in the positive working capital group.

This study is original in that we considered firms' financial aspects (Cash Level) and operational aspects (CCR) of working capital (WCR) separately to understand the role of a firm's cash level. In addition, this study applied restaurant firms' unique operational and financial structures, such as positive/negative working capital and positive/negative cash levels, into the analysis models since traditional working capital measurements and the Cash Conversion Cycle do not reflect these specific features. In this regard, this study fills the gap between traditional working capital measurements and the Cash Conversion Cycle by discerning the interactive effects between firms' cash levels (Cash Level) and working capital (WCR).

Based on the findings, this study also reveals that the majority of restaurant firms managed their working capital very tightly. Specifically, approximately half of the restaurants had negative working capital or negative cash levels. Many restaurant firms rely heavily on credit from supplier, which means that they are vulnerable to unexpected operational and financial risks.

5.2. Implications

This study provides important theoretical and managerial implications for the industry. Theoretically, this study provides evidence of a non-linear relationship between a firm's working capital and profitability in a restaurant industry setting. One important finding is the role of cash among working capital components, which has not been considered in previous studies. The results indicate that a restaurant firm's cash level can be used as a proxy for internal cash generating capability. This study found a significant negative interaction effect for cash level in firms with positive working capital, but no significant interaction effect in firms with negative working capital. One possible reason may be related to the high operational constraints for firms with negative working capital, which restricts managers' financial decisions on holding cash or working capital. Thus, there is very little flexibility in managing working capital (e.g., Cash Level, ARR, IVNR, and APR) among firms with negative working capital. The findings also imply that either traditional working capital measurements or CCC are appropriate for determining the relationship between working capital management and operating performance in firms with negative working capital. However, neither measurement is appropriate, or at the very least entirely accurate, for firms with positive working capital unless their cash levels are considered in the analysis.

In terms of practical implications, this study suggests that when restaurant firms have positive working capital, it is better for the firms to ease the Cash Conversion Cycle either by investing more in inventories or paying-off accounts payable early. Furthermore, if the firms have good cash generating capabilities from operation they do not need to hold too much cash as long as they maintain enough accounts receivable and inventories. However, when firms do not enough working capital, they need to secure assets more quickly either by delaying investments, reducing expenses, or obtaining loans to avoid the negative effects from cash short falls. Such firms need to increase working capital until it reaches approximately 4% of sales.

Although we focused on the relationship between restaurant firms' working capital and profitability, this study makes a unique contribution to the literature since we investigated firms with both positive and negative working capital, which is not common in IT (Information Technology), manufacturing, or retail industries. Contrasting these two opposite cases provides a clearer understanding of the impact of working capital on a firm's profitability. Practically, this study is also helpful to restaurant managers making decisions about credit policies for customers and suppliers based on their firm's specific financial conditions since the results can be used as a reference for industry norms.

5.3. Limitations and future research

Even though this study makes a contribution toward better understanding working capital management for restaurant firms, it unavoidably has some limitations. This study only focused on restaurant firms and, thus, the findings of this study may not be directly applicable to other industries such as IT, finance, or traditional manufacturing industries that maintain high levels of cash or working capital. In addition, the results may not be valid to other industries because restaurant firms are quite unique in that they usually hold lower levels of inventories, accounts receivable, and operating profitability. Lastly, similar studies using other industries that maintain high levels of cash or working capital can provide different results for working capital or cash on operating performance. Thus, it is suggested that researchers test more diverse industries with cash or working capital statuses that differ from restaurant firms for future studies.

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