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Master Thesis Financial Economics

The Effect of Working Capital Management on Profitability measured by Gross Income for UK Small and Medium sized Enterprises

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Abstract

This paper examines the relation between a firm's profitability, measured by gross income, and working capital management. A panel data set of the years 2011 to 2021 of 1359 UK SMEs is used. The cash conversion cycle and its components are the measures for working capital. No significant relationship is found between the cash conversion cycle and profitability. A positive and significant relation is found for inventory and accounts payable. The latest has a stronger relation for smaller than for larger companies in the sample.

Contents

1 Introduction

Most of the studies in the area of corporate finance are focused on long term decision making. Studies on investments, capital structures, dividends, and company valuation, have been presented by researchers (Soenen & Shin, 1998). However, the majority of items on a company's balance sheet are short-term assets and liabilities that have maturities of less than one year. In addition, in my sample, small and medium-sized UK companies' current assets make up 62 percent of the sample's total assets, while on average the current liabilities account for more than 50 percent of their total liabilities.

Harris, 2005 states that the main idea behind working capital management is to make sure that the business can close the gap between its short-term assets and short-term liabilities. However, a overall approach is preferred because it can include all of the company's supplier, customer, and product-related activities (Hall, 2002).

Working capital management has in fact become one of the most crucial concerns in businesses where many finance managers find it difficult to define the fundamental factors that influence working capital and the ideal amount of working capital (Lamberson, 1995). Therefore, by understanding the factors of working capital management, businesses can reduce risk and enhance overall performance.

A business could decide to adopt an aggressive working capital management approach with low current assets as a percentage of total assets and to use a high amount of current liabilities. The profitability of the company may be negatively impacted by high current asset levels, while low current asset levels may result in limited liquidity and stockouts, making it difficult to maintain smooth operations (Horne & Wachowicz, 2004).

Maintaining an ideal equilibrium between all of the working capital components is the basic goal of working capital management. The ability of the financial executives to efficiently manage accounts payable, inventory, and accounts receivable is crucial for business performance (Flibeck & Krueger, 2005). By reducing the amount of investment locked up in present assets, businesses can lower their financing costs and/or increase the amount of money available for expansion purposes. Restoring current assets and liabilities to appropriate levels takes up the majority of the time and effort spent by financial managers (Lamberson, 1995). The level of working capital which achieves a balance between risk and efficiency would be considered optimal. To maintain the right level in the many working capital components, such as accounts receivables, inventories, and accounts payables, constant monitoring is necessary.

In general, current assets are regarded as one of the crucial parts of a company's overall assets. While a company may be able to lower its investment in fixed assets to rent or to lease equipment, it cannot apply the same strategy to the elements of working capital. The risk of liquidity linked with the opportunity expense of funds that may have been put in long-term assets may be reduced by the high level of current assets. There haven't been many empirical studies that look at the relationship between working capital policies and profitability, despite the fact that this relationship is quite essential. This paper is based on 1359 UK small and medium sized enterprises. With most import finding, a positive relation between the accounts payable and profitability.

The paper has the following structure; section 2 literature overview, section 3 data, section 4 methodology, section 5 results, and section 6 conclusion.

2 Literature overview

2.1 Relationship between gross income and days account receivable

The average amount of time needed to turn a company's accounts receivable into cash after a sale is referred to average days accounts receivable and is calculated as (accounts receivables/revenue)*365. It is determined by dividing the total amount of accounts receivable by the yearly revenue. This ratio gauges how long it takes to turn the sales into cash.

A bigger investment in accounts receivable is needed when the average collection duration is longer. The less money is available to meet cash withdrawals, such as paying bills, when more money is invested in accounts receivable (Enqvist, Graham, & Jussi, 2014).

Garcia-Teruel & Martinez-Solano, 2007 demonstrates that the profitability and average collection period have a statistically significant negative correlation. This finding implies that businesses might increase their profitability by cutting down on the amount of accounts receivable that they have outstanding. This can also be read as, the quicker clients pay their bills, the more money is available to restock inventory, the higher the sales realized, and the higher the firm's profitability.

Because of the negative relationship between days accounts receivables and profitability, it is possible that a day extra in the number of days accounts receivable will result in a decrease in profitability. By doing so, managers can increase profitability by cutting back on the credits provided to their clients, Tryfonidis and Lazaridis (2006).

According to Deloof (2003), managers can boost corporate profitability by shortening the collecting period. There is a bigger risk that the company’s profitability will decrease when the number of days accounts receivable outstanding is higher. Without debtor management, businesses may see a rise in bad debts and ultimately lose control of them. Therefore, the probability that a corporation will never get payment increases the longer anyone owes it money. Consequently, a profit can only be referred as genuine profit once the receivables have been converted to cash. As a result, managing account receivables is a necessity that is significantly influenced by the credit policy and collection process.

A collection procedure that provides guidelines to collect unpaid invoices, will as a consequence decrease outstanding receivables, while a credit policy provides rules to evaluate the worthiness of consumers (Brigham & Houston, 2021). Thus, there is an inverse

relationship between profitability and the length of time it takes for businesses to collect money from their clients (known as the receivables collection period).

In contradiction to the cost of accounts receivables, trade credit offered to the buying party might stimulate sales. The cost of capital invested in debtor might be offset by the extra revenue that is generated by a trade credit offered (Long, Abraham Ravid, & Malitz, 1993)

Trade credit could stimulate sales in two ways. 1) Granting trade credit will be an effective discount for buyers because buyers don't need to pay the finance costs (Petersen & Rajan, 1997). 2) Offering trade credit will allow buyers check the services, quantity and quality before paying for the good . (Long, Abraham Ravid, & Malitz, 1993).

The following hypothesis is based on the above standing literature; H1: There is a negative relation between accounts receivables and profitability.

2.2. Relationship between gross income and inventory days

Inventory days, a measure of how effectively inventories are managed and calculated by inventory/cost of sales*365. Insufficient sales or an oversupply of inventory may be indicated by a low inventory days ratio (Ruichao, 2013). According to (Mansoori & Muhammad, 2012), managers can increase firms' profitability by reducing the amount of inventory days. (Dong, 2010) looks at profitability, the cash conversion cycle, and its related parts, as well as the relationship between them. The study shows that profitability and the CCC have negative relation with each another. This indicates that an increase in the cash conversion cycle causes a drop in profitability. Additionally, it shows that profitability rises when account receivables and inventory days decrease.

Despite the fact that the majority of empirical studies Ruichao, 2013; Lazaridis and Tryfonidis, 2006; Mansoori and Muhammad, 2012; Dong, 2010 indicate a negative relationship between inventory days and profitability. Teruel and Martinez-Solano (2007) cannot prove a negative effect between inventory days and profitability. Other studies find a positive relationship between inventory days and profitability Gill, Biger and Mathur (2012) and Mathuva (2015).

In contrast to investing excessive amounts of money in inventories, which unnecessarily consumes working capital that could be used to invest in cash generating activities, maintaining sufficient levels of inventory lowers expenses associated with potential delays in the production process and loss of business due to a shortage of products (Mathuva 2015). Inventory management strategically boosts profitability because it affects a company's level

of activity (Brigham and Houston, 2003). Knowing how rapidly the company's overall inventory is moving and how long each piece of stock stays on the racks before being sold is essential for effective inventory management. It takes skill to balance inventory. Stocks that are too high might put a significant strain on a company's cash flow.

Stock shortages may lead to dropped sales, client delays, etc. To set optimal stock levels for each category and, as a result, reduce the amount of cash held in stock, a corporation must first identify the fast and slow stock movers. Long-term stock storage costs money and could have a negative impact on a company's profitability (Silver, 1981).

The following hypothesis is based on the above standing literature; H2: There is a negative relation between inventories and profitability.

2.3 Relationship between days accounts payable and gross income

The average time between purchasing materials and paying for them in cash is the amount of days account payable an can be calculated as (account payables/cost of sales)*365. Account payables are crucial to managing working capital since postponing bill payments gives management access to a low-cost source of funding. However, Ruichao (2013) finds that if an early payment discount is provided, the opportunity cost of maintaining high account payables could harm the company. According to Cheng & Pike (2003), payment terms tend to be relative longer the UK compared to the global average. This would enhance the effect of low-cost funding.

According to the working capital management rule, businesses should make an effort to pay creditors as late as feasible while being careful not to damage their working relationship. This is according to the positive correlation between accounts payable and profitability when the number of days for accounts payable increases (Enqvist, Graham, & Jussi, 2014).

Delaying the payment of accounts payable to suppliers enables businesses to access the quality of products and may be a cheap source of finance. On the other hand, if a firm is given a discount for a on time payment payment, postponing such payables can be costly. According to Garcia Teruel and Martinez-Solano (2007) there is a significant positive correlation between profitability and the amount of time it takes a company to pay its debtors (days accounts payable) .

Even yet, studies by Ruichao (2013), Muthuva (2010), Garcia Teruel and Martinez-Solano (2007), and Gill, Biger, & Mathur (2010) demonstrate a positive relation between profitability

and the accounts payment. Another study reveal a negative correlation between the payment duration and the firm profitability Deloof (2003).

The following hypothesises are based on the above standing literature;

H3: There is a positive relation between accounts payable and profitability.

H4: There is a negative relation between CCC and profitability.

2.4 CCC small companies

The Cash convention cycle has been studied in earlier researches, to examine if reducing the amount of working capital has a favourable or unfavourable impact on the profitability of the company. Shin and Soenen (1998) specifically examine the relationship between profitability and the cash conversion cycle for a sample of companies that were listed on the US stock exchange between 1974 and 1994. Their findings demonstrate that a reasonable reduction in the cash conversion cycle boosts business profitability.

More recently, Deloof (2003) examined a sample of major Belgian businesses from 1992 to 1996. His findings demonstrate that lowering the number of days that accounts receivable and lowering inventories can help Belgian businesses become more profitable.

The two earlier studies concentrated their research on bigger companies. However, for small and medium-sized businesses, managing current assets and obligations is especially crucial. Current assets make up the majority of the assets of these businesses (Walker & Petty, 1978). Additionally, given their challenges in acquiring financing in the long-term capital markets and the financial constraints they experience, current obligations are one of their primary sources of external financing (Petersen & Rajan, 1997). Danielson & Scott (2000) and Petersen and Rajan (1997), both demonstrate this argument by demonstrating how small- and medium-sized US businesses employ vendor financing after they have are not able to acquire more debt. Therefore, effective working capital management is crucial for smaller businesses (Peel, Wilson, & Howorth, 2000)

The following hypothesis is based on the above standing literature; H5: There is a stronger negative relation from small companies between CCC and profitability compared to larger companies (on total assets).

3 Data

3.1 Sample selection

The ORBIS database provided the data for this study. Bureau van Dijk conducted this database, which includes world wide financial and economic information about private and public businesses.

UK based small and medium sized businesses make up the sample. I follow the criteria specified by the European Commission regarding the definition of small and medium-sized businesses in the selection of SMEs. I choose businesses that had complied with the following standards for at least four years: less than 250 workers, a revenue of under €40 million, and a total asset base of under €27 million[1].

Beside using the above standing selection criteria, I also use a number of filters. I remove company observations operating the financial sector (SIC code 6). Finally, I winsorize 1 percent of the extreme values of gross income and revenue growth. This means the 1 percent of the lowest and highest values of gross income were transformed to the 1 percent and 99 percent value of gross income (Cox, 2006). These criteria enable me to obtain a sample of 1359 UK private limited firms for the period of 2012 to 2021, Resulting 13.590 observations (company years).

3.2 Variables

To calculate profitability, gross operating income is divided by total assets. Revenue less cost of goods sold, divided by total assets, gives gross operating income variable. Financial assets make up, on average, a very low portion of the total assets for the selected firms. For this reason, gross return on assets is considered as a measure of profitability. Additionally, businesses that primarily operate in the financial sector have lots financial assets will be excluded from the sample.

The ratio days accounts receivable is determined by (accounts receivable/revenue*365). Inventory days are calculated as (inventory/cost of sales*365). Accounts payable days are calculated as (accounts payable/cost of sales*365).

[1] https://ec.europa.eu/regional-policy/sources/conferences/state_aid/sme/smedefinitionguide-en

I calculate the cash conversion cycle (CCC) by taking these three above standing measures into account collectively. The CCC value is determined by subtracting the number of days accounts payable from the total number of days inventory plus days account receivable. The bigger the net investment in current assets, and the greater the requirement for current asset financing, the longer the cash conversion cycle.

I add the firm's size, sales growth, sales, and leverage as control variables. I calculate the leverage (lev) as the ratio of debt to total assets, the size (LNa) as the logarithm of assets, sales (LNrev) as the logarithm of sales, and the sales growth (Drev) as (Revenue $_{t}$ – Revenue $_{t-1}$)/Revenue $_{t-1}$.

3.3 Description of sample

Current assets and liabilities are different for all companies depending on the sector in which the firm operates. Table I shows the gross operating income divided by assets, the CCC and the amount of days accounts receivable, days inventory, and days accounts payable by sector. The two sectors with the highest gross income on assets are trade (wholesale and retail, both SIC code 5) and services. The gross income on assets ratio are respectively 0.50 and 0.44. The lowest gross income relative to assets are in the sectors of agriculture and mining & construction (0.4, 0.36), which are more asset heavy industries.

As expected, the enterprises active in the trade (wholesale and retail, both SIC code 5) need the shortest amount of days to collect payments from their clients, on average, 40 days. Businesses in mining and construction give their consumers the most time to pay, 66 days. The companies in the transport and public services are found next, with a total of 61 days for accounts receivable.

Additionally, I discover that goods are stored for the shortest period for enterprises in the transport and public services , inventory is kept the longest in agriculture. Companies in the sector of public administration pay their suppliers first (38 days), in terms of the number of days for accounts payable. The average time it takes businesses in the mining & construction and services industries to pay their suppliers is more than 61 days. However, these businesses also provide their own clients the most leeway when it comes to making payments. When we combine all the average periods, all sectors have a positive cash conversion cycle. The sector with, on average, the shortest CCC is services, 10 days. Agriculture and manufacturing have the longest CCC, respectively 104 days and 87 days.

Table II shows the descriptive statistics of the sample. All variables have 13,590 observation except of revenue growth because a one year lag per company. The average ratio of Gross operating income on assets is 0.445 after winsorizing.

Table I - Mean Values by Sector

GIA measure Gross income on assets, CCC cash conversion cycle, AR number of days accounts receivable, INV number of days inventories, and AP number of days accounts payable

Industry	GIA	CCC	AR	INV	AP	Obs
Agriculture	0.34	103.62	50.92	100.76	48.07	260
Mining & construction	0.36	47.41	66.60	41.84	61.03	1420
Manufacturing	0.44	86.54	62.32	75.08	50.86	4830
Transport and public services	0.40	21.36	61.03	12.50	52.17	1050
Trade	0.50	59.62	40.39	72.37	53.14	3540
Services	0.44	10.49	42.75	29.33	61.59	1740
Public & Administration	0.40	35.12	43.87	30.13	38.88	750

Note: Obs are observation (company years per sector)

Table II - Descriptive statistics

1359 UK non-financial SMEs, 2012-2021

Var	Variable	Obs	Mean	Std. dev.	Min	Max
Gross operating income on assets	GIA	13,590	0.445	0.310	-0.391	4.123
# of days accounts receivable	AR	13,590	53.214	36.151	0.000	989.753
# of days accounts inventories	INV	13,590	58.220	93.871	-253.649	4,533.753
# of days accounts payables	AP	13,590	53.279	61.557	-140.280	2,277.105
Cash conversion cycle	CCC	13,590	58.156	109.678	-2,274.598	4,349.532
Logarithm of revenue	LNrev	13,590	9.427	0.562	6.500	10.717
Revenue growth	Drev	12,231	453.398	2,583.659	-13,598.55	13,419
Leverage	lev	13,590	0.209	0.269	0.000	5.668
Logarithm of Assets	LNa	13,590	9.059	0.533	7.318	10.630

3.4 Pearson correlation

Table III displays the correlation matrix for the variables described in the preceding section. I discover a negative link between gross income on assets and the amount of days inventory and accounts receivable. The correlation between gross income on assets and accounts payable is positive, which results in a correlation with the cash conversion cycle that is negative. This shows that a reduction in the amount of time products are kept in stock and an earlier collection of payments from customers are linked to higher company profitability. Contrarily, paying suppliers later implies a larger gross income. When all components are taken into account (CCC), the negative connection found suggests that increasing profitability is connected with reducing the cash conversion cycle, which could help explain the positive impact that better working capital management has on business profitability.

Table III

4 Methodology

4.1 Regressions estimation

I estimate the following regression model to study the influence of the CCC, days accounts receivable, days inventory, and days accounts payable on gross income. This model is based on the structures of the models used earlier by Deloof (2003) and Lazaridis and Tryfonidis (2006).The below standing regression are estimated in with two different methods. First with a dummy variable for year and industry (2 digit SIC code). Subsequently the regressions are estimated for company fixed effects.

$$GIA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 lev_{it} + \beta_3 LNa_{it} + \beta_4 Drev_{it} + \beta_5 LNrev_{it} + \varepsilon_{it} \quad (1)$$

$$GIA_{it} = \beta_0 + \beta_1 AR_{it} + \beta_2 lev_{it} + \beta_3 LNa_{it} + \beta_4 Drev_{it} + \beta_5 LNrev_{it} + \varepsilon_{it} \quad (2)$$

$$GIA_{it} = \beta_0 + \beta_1 INV_{it} + \beta_2 lev_{it} + \beta_3 LNa_{it} + \beta_4 Drev_{it} + \beta_5 LNrev_{it} + \varepsilon_{it} \quad (3)$$

$$GIA_{it} = \beta_0 + \beta_1 AP_{it} + \beta_2 lev_{it} + \beta_3 LNa_{it} + \beta_4 Drev_{it} + \beta_5 LNrev_{it} + \varepsilon_{it} \quad (4)$$

GIA measures the gross income on assets, the number of days in the following categories: CCC (cash conversion cycle), AR (accounts receivable), INV (inventory), and AP (accounts payable). Lev is the debt ratio (leverage), LNa the logarithm of total assets, , Drev the revenue growth $(Rev_t - Rev_{t-1})/Rev_{t-1}$, and LNrev the logarithm of revenue. λt estimates the 56 industry dummy variables (2 digit SIC code) and 10 year dummy variables for the OLS regression.

Next, I add a dummy variable for size to the OLS regressions to determine if there is a difference between the larger and smaller half of the sample. The definition of the dummy variable for size is; 1 for the largest half of the sample and 0 for the smallest half, based on total assets.

4.2 Regression difference on size

To test hypothesis 5; There is a stronger negative relation from small companies between CCC and profitability compared to larger companies (on total assets). I applied all the regressions with a dummy variable for size. The variable is zero for the smallest half of the company years of the sample, based on total assets and vice versa. If the regressions lead to a coefficient for size that is different from zero, the below standing method can be used the test is there is a different effect for the two sub samples.

I apply the OLS regressions with the sample split in two equal samples divided on company size (total assets). As a result this method will estimate two coefficients for the cash convention cycle and the three components of the CCC.

To test if the difference between both coefficients is equal to zero for the small and large half of the sample. I applied a Chi-square test on equal coefficients for the following equations. Below the hypotheses of test of difference on size.

H_0 = *[large_mean](CCC, AR, INV, AP) - [small_mean] (CCC, AR, INV, AP) = 0*

H_1= *[large_mean](CCC, AR, INV, AP) - [small_mean] (CCC, AR, INV, AP) ≠ 0*

5 Results

5.1 Industry fixed effects

The variables who have an effect on gross operating income divided by assets are investigated for all 13.590 firm-year observations. In regressions in table IV, the determinants of gross operating income are estimated using plain OLS and include the growth of revenue, logarithm of revenue, leverage, logarithm of assets, 10 year dummies and 56 industry dummy variables as control variables. The OLS estimation does not take firm specific differences of gross income into account.

Table IV displays the OLS regression analysis' findings. The model's adjusted R-squared is 0.4007, indicating that the model adequately accounts for 40% of the variation of gross income divided by total assets.

The regression results show a negative (-0.0000) relation between the cash conversion cycle and gross income divided by assets, but the significance level is above the threshold of 5 percent. Which suggests that changes in the cash conversion cycle have no signific impact on a company's gross income. The regression shows that the AR (days accounts receivable) coefficient is negative with a p-value of 0.570 and a coefficient of -0.009. This suggests that the profitability of the company will be negatively impacted by a rise in AR, also not within the significance interval. Gross income and inventory days have a positive (0.0003) and significant relationship, meaning that as inventory turnover in days declines, gross income increases. With a positive coefficient of 0.0005 and a p-value of 0.000, AP (accounts payables) indicates that the average payment time has a substantial impact on the firm's profitability. The longer the average payment term, the more profitable the business is, according to the correlation between profitability and average payment period. When leverage of the firm is decreases, profitability increases because of the negative coefficient between the dependent variable and the leverage ratio. The size of the firm has a negative impact on gross income, implying that with the decrease in assets, gross income will increase. Sales has a positive relationship with gross income, which a quite common sense. Sales growth, gives a coefficient of 0.000, implicating a small effect on de dependent variable.

The results of regressions in table IV indicate that executives can increase a company's profitability by increasing the days accounts payable and days inventory. An explanation for the positive relation between accounts payable and gross operating income could be that capital in tight up in short term assets that could have been used for cash generating assets.

Table IV - Working capital on gross income divided by assets

Dummy Variable year, industry 2 digit SIC, OLS

Gross Operating Income	**1**	**2**	**3**	**4**
CCC	-0.0000			
	(0.000)			
AR		-0.0009		
		(0.570)		
INV			0.0003	
			(0.015)	
AP				0.0005
				(0.000)
Lev	-0.0474	-0.0471	-0.0474	-0.0498
	(0.112)	*(0.114)*	*(0.112)*	*(0.073)*
LNa	-0.2899	-0.2897	-0.3016	-0.3007
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*
Drev	0.0000	0.0000	0.0000	0.0000
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*
LNrev	0.2888	0.2188	0.2318	0.2298
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*
R Squared	0.4007	0.4007	0.4082	0.4177

Note: P-values with clustered standard errors by company are noted in parenthesis. Regressions use 10 year dummies and 56 industry dummies (2 digit SIC). Results reported in thousands British Pounds. GIA measure Gross income on assets, CCC cash conversion cycle, AR number of days accounts receivable, INV number of days inventories, AP number of days accounts payable, lev leverage, LNa logarithm of assets, Drev revenue growth, and LNrev logarithm of revenue.

5.2 Firm fixed effects

Regression using fixed effects is based on company-specific intercepts, which capture the effects of variables unique to each firm and constant across time. Fixed effects estimates has the drawback of omitting all time-invariant elements from the model.

The results of fixed effects regressions can be found in table VI. Even though, the R squared coefficients are slightly higher than the R squared coefficients of the OLS regressions, the significance of the independent variables AR, INV, AP, and the CCC coefficients are low

(0.863, 0.319, 0.409, 0.327). Which makes all coefficients insignificant. The control variables in the company fixed effect regressions give similar and significant coefficients.

Table VI - Working capital on gross income divided by assets

Company fixed effects

Gross Operating Income	**1**	**2**	**3**	**4**
CCC	0.0000	-	-	-
	(0.327)			
AR	-	0.0000	-	-
		(0.863)		
INV	-	-	0.0000	-
			(0.319)	
AP	-	-	-	0.0000
				(0.409)
Lev	-0.0492	-0.0495	-0.0485	-0.0492
	(0.003)	*(0.003)*	*(0.003)*	*(0.003)*
LNa	-0.3499	-0.3494	-0.3508	-0.3497
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*
Drev	0.0000	0.0000	0.0000	0.0000
	(0.005)	*(0.000)*	*(0.000)*	*(0.011)*
LNrev	0.3047	0.3042	0.3061	0.3046
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*
R Squared	0.4770	0.4767	0.4773	0.4768

Note: P-values with clustered standard errors by company are noted in parenthesis. Results reported in thousands British Pounds. GIA measure Gross income on assets, CCC cash conversion cycle, AR number of days accounts receivable, INV number of days inventories, AP number of days accounts payable, lev leverage, LNa logarithm of assets, Drev revenue growth, and LNrev logarithm of revenue.

5.3 Working capital management and size

A couple of conclusion can be drawn from above standing results. INV, and AP individually influence a company's gross income. The regression with the CCC as independent variable results in a negative coefficient, but insignificant. Which suggests, when less capital invested in working capital, gross income will be higher.

Total assets of the companies in this sample ranges from 1.507 to 41.347 thousand pounds in 2021. The sample is divided into 2 equal subsamples of 6795 company years, resulting in a sample 'small' and 'large'. I used two different methods to test if the effect is stronger for the smaller sample, which is suggested by existing literature on corporate finance (Petersen & Rajan, 1997) (Rajan & Zingales, 1995).

An extra dummy variable for 'large' added to the both the OLS and company fixed effect regression. The results are presented in table V. None of the four industry fixed regressions have an significant coefficient for size (dummy variable large), and the coefficients for the components of and the CCC did not change. Relative to regression without the dummy variable for size

When the sample is divided on total assets, I applied the 4 regressions with the independent variables for the subsamples. The results presented in table XIII till table XI. All the regressions have a larger coefficient for the independent variable for the small subsample. As a result of the Chi-test only accounts payables has a significant different coefficient between the smaller and larger subsample.

Table V - Working capital on gross income divided by assets

Dummy Variable size, year, industry 2 digit SIC, OLS

Gross Operating Income	**1**	**2**	**3**	**4**
CCC	-0.0000	-	-	-
	(0.780)			
AR	-	-0.0009	-	-
		(0.574)		
INV	-	-	0.0003	-
			(0.015)	
AP	-	-	-	0.0006
				(0.000)
Lev	-0.0475	-0.0472	-0.0474	-0.0499
	(0.112)	*(0.114)*	*(0.111)*	*(0.072)*
LNa	-0.2933	-0.2931	-0.3059	-0.3031
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*
Drev	0.0000	0.0000	0.0000	0.0000
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*
LNrev	0.2188	0.2187	0.2316	0.2298
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*
Large	0.0046	0.0046	0.0057	0.0032
	(0.667)	*(0.668)*	*(0.590)*	*(0.763)*
R Squared	0.4007	0.4007	0.4082	0.4177

Note: P-values with clustered standard errors by company are noted in parenthesis. Regressions use 10 year dummies and 56 industry dummies (2 digit SIC). Results reported in thousands British Pounds. GIA measure Gross income on assets, CCC cash conversion cycle, AR number of days accounts receivable, INV number of days inventories, AP number of days accounts payable, lev leverage, LNa logarithm of assets, Drev revenue growth, and LNrev logarithm of revenue.

6 Conclusion

The management of working capital is crucial for small and medium sized enterprises. Current assets make up the majority of the assets of these firms. Additionally, one of their primary sources of outside funding are current liabilities. In light of this, the goal of this study is to present empirical data regarding the impact of working capital management on the profitability measured by gross income of a sample of small and medium sized UK companies. I collected panel data of 1359 SMEs during the years 2011 to 2021 for this study.

The analyses partly supports the significance of working capital management in creating value in small and medium-sized businesses, which is in line with earlier research that concentrated on large organizations (Shin and Soenen, 1998; Deloof, 2003) on overall level of working capital. I find a inverse relationship between a SME's profitability and the amount of accounts receivable and the cash conversion cycle, but not significant. In contradiction Deloof (2003), I find a positive significant relation between days inventory and accounts payables.

A regression on size concludes that smaller SMEs are not significantly more effected by working capital management overall. The effect of the amount of accounts payable is significant larger for smaller SMEs compared to larger SMEs.

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Appendix

Table I - Mean Values by Sector

GIA measure Gross income on assets, CCC cash conversion cycle, AR number of days accounts receivable, INV number of days inventories, and AP number of days accounts payable

Industry	GIA	CCC	AR	INV	AP	Obs
Agriculture	0.34	103.62	50.92	100.76	48.07	260
Mining & construction	0.36	47.41	66.60	41.84	61.03	1420
Manufacturing	0.44	86.54	62.32	75.08	50.86	4830
Transport and public services	0.40	21.36	61.03	12.50	52.17	1050
Trade	0.50	59.62	40.39	72.37	53.14	3540
Services	0.44	10.49	42.75	29.33	61.59	1740
Public & Administration	0.40	35.12	43.87	30.13	38.88	750

Note: Obs are observation (company years per sector), sample is not selected on equal distribution.

Table II - Descriptive statistics

1359 UK non-financial firms, 2012-2021

Var	Variable	Obs	Mean	Std. dev.	Min	Max
Gross operating income	GIA	13,590	0.445	0.310	-0.391	4.123
# of days accounts receivable	AR	13,590	53.214	36.151	0.000	989.753
# of days accounts inventories	INV	13,590	58.220	93.871	-253.649	4,533.753
# of days accounts payables	AP	13,590	53.279	61.557	-140.280	2,277.105
Cash conversion cycle	CCC	13,590	58.156	109.678	-2,274.598	4,349.532
Logarithm of revenue	LNrev	13,590	9.427	0.562	6.500	10.717
Revenue growth	Drev	12,231	448.693	2,842.845	-28,937.07	22,419.420
Leverage	lev	13,590	0.209	0.269	0.000	5.668
Assets	LNa	13,590	9.059	0.533	7.318	10.630

Table III - Pearson correlation

Pearson correlation coefficients

Variable	Gross operating income	# of days accounts receivable	# of days accounts inventories	# of days accounts payables	Cash conversion cycle	LN Revenue	Rev growth	leverage	LN Asset
Gross operating income	1								
# of days accounts receivable	-0.1036	1							
# of days accounts inventories	-0.0348	-0.0302	1						
# of days accounts payables	0.0652	0.1383	0.0916	1					
Cash conversion cycle	-0.1005	0.2261	0.7945	-0.4373	1				
LN Revenue	0.1498	0.03	-0.0624	-0.0933	0.0089	1			
Revenue growth	0.1043	-0.0446	-0.0359	-0.0241	-0.0314	0.2438	1		
Leverage	-0.0439	-0.0332	-0.0152	0.0375	-0.045	-0.1973	0.0358	1	
Ln Assets	-0.3744	0.0823	0.1311	0.0641	0.1034	0.3993	0.0809	-0.0488	1

Table VIII - Suest Chi Squared test CCC

Coefficient test spitted sample on total assets

Gross Operating Income	**Small**	**Large**
CCC	-0.0002	0.0000
	(0.001)	*(0.247)*
Lev	-0.043	-0.0768
	(0.000)	*(0.000)*
LNa	-0.3854	-0.2129
	(0.000)	*(0.000)*
Drev	0.0000	0.0000
	(0.000)	*(0.000)*
LNrev	0.2606	0.1836
	(0.000)	*(0.000)*

[large_mean]CCC - [small_mean]CCC = 0

chi2(1) = 1.95
Prob > chi2 = 0.1623

Table IX - Suest Chi Squared test AR

Coefficient test spitted sample on total assets

Gross Operating Income	Small	Large
AR	-0.0001	-0.0001
	0.612	0.204
lev	-0.0388	-0.0763
	0.000	0.000
LNa	-0.3883	-0.2111
	0.000	0.000
Drev	0.0000	0.0000
	0.000	0.000
LNrev	0.2649	0.1825
	0.000	0.000

[large_mean]AR - [small_mean]AR = 0

chi2(1) = 0.01
Prob > chi2 = 0.9406

Table X - Suest Chi Squared test INV

Coefficient test spitted sample on total assets

Gross Operating Income	**Small**	**Large**
INV	0.0003	0.0002
	0.000	0.000
lev	-0.0375	-0.0774
	0.000	0.000
LNa	-0.4011	-0.2224
	0.000	0.000
Drev	0.0000	0.0000
	0.000	0.000
LNrev	0.2806	0.1925
	0.000	0.000

[large_mean]INV - [small_mean]INV = 0

chi2(1) = 0.38
Prob > chi2 = 0.5371

Table XI - Suest Chi Squared test AP

Coefficient test spitted sample on total assets

Gross Operating Income	**Small**	**Large**
AP	0.0009	0.0004
	0.000	0.000
lev	-0.0503	-0.0745
	0.000	0.000
LNa	-0.4072	-0.2151
	0.000	0.000
Drev	0.0000	0.0000
	0.000	0.000
LNrev	0.2791	0.1908
	0.000	0.000

[large_mean]AP- [small_mean]AP = 0

chi2(1) = 7.56
Prob > chi2 = 0.0060