

WORKING CAPITAL MANAGEMENT AND SME FINANCIAL PERFORMANCE: A META-ANALYTIC SYNTHESIS

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Abstract

Working capital management (WCM) is widely regarded as a determinant of profitability for small and medium enterprises (SMEs), yet the empirical evidence is inconsistent, with negative, positive, and nonlinear associations reported. This study systematically reviews and meta-analyses SME evidence published between 2020 and 2025. A documented search of the Semantic Scholar Academic Graph and the Directory of Open Access Journals, reported according to PRISMA 2020, identified 205 records; 17 studies met the eligibility criteria and 15 provided recoverable effect sizes. Correlations were pooled with a random-effects model after Fisher's z transformation, supplemented by Hartung–Knapp confidence intervals, prediction intervals, and subgroup, leave-one-out, and small-study analyses. Across 14 studies, a longer cash conversion cycle is associated with lower profitability ($r = -0.137$, 95% CI $[-0.203, -0.070]$; Hartung–Knapp $p = 0.004$), a modest association equivalent to about 2% of the variance in profitability. Days inventory outstanding shows a similar association ($r = -0.117$), whereas the associations for receivable and payable periods are small and not robust. Heterogeneity is substantial ($I^2 \approx 95\%$), the prediction interval for the cash conversion cycle includes positive values, and neither region nor effect-size type explains the variation. Many excluded studies, including every Indonesian study retrieved, relied on perception scales, monetary levels, or qualitative designs rather than period-based ratios, so Indonesian SMEs remain unrepresented in the quantitative evidence. The findings support optimising, rather than simply minimising, working capital within each firm's operating context, and they identify measurement practice as a priority for future SME research.

Keywords: *cash conversion cycle; financial performance; meta-analysis; small and medium enterprises; systematic review; working capital management.*



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1. Introduction

Working capital management is closely linked to the financial performance and survival of small and medium enterprises (SMEs). Unlike large corporations with access to multiple financing sources and advanced treasury operations, SMEs face significant constraints in managing short-term assets and liabilities. As a result, efficient working capital management is important for operational sustainability and profitability. The main challenge is balancing liquidity needs with profitability objectives: maintaining adequate working capital to meet operational requirements while limiting the opportunity cost of capital tied up in current assets.

Working capital management matters in SMEs for several reasons. First, SMEs generally have limited access to external financing, making internal liquidity management vital for daily operations. Second, SMEs usually lack the bargaining power of larger firms when negotiating payment terms with suppliers and customers. Third, resource constraints may prevent SMEs from accessing specialized financial management expertise, which can lead to suboptimal working capital decisions. Collectively, these factors highlight the need for evidence-based guidance on working capital management practices tailored to the SME context.

Despite extensive research, empirical findings on this relationship remain inconsistent. Many studies report that longer cash conversion cycles are associated with lower profitability. In a panel of 366 Ghanaian SMEs, the cash conversion cycle correlated negatively with return on assets (Braimah et al., 2021), and comparable negative associations have been reported for Greek SMEs (Pazarskis et al., 2024) and for Spanish fish-canning firms, most of which are SMEs (Rey-Ares et al., 2021). Other studies report the opposite sign. Listed Malaysian SMEs with longer cash conversion cycles earned higher returns on assets (Hoang & Duong, 2020), and in a Kosovar panel the correlation was negative but the regression coefficient with controls was positive (Ahmeti et al., 2022). Still other studies find nonlinear patterns: the receivables collection period of Ghanaian SMEs shows an inverted U-shaped association with profitability, implying an interior optimum (Braimah et al., 2021).

These contradictory findings may reflect genuine differences across industries, markets, and institutional environments; methodological differences in variable definitions, estimators, and sample composition; or genuine nonlinearities, with firms located on different sides of an optimal working capital level. Distinguishing among these

explanations requires a quantitative synthesis that weights studies by their precision and tests formally whether disagreement exceeds what sampling error alone would produce.

Two meta-analyses have addressed the working capital–profitability relationship, but neither focuses on recent SME evidence. Singh et al. (2017) pooled 46 studies of firms of all sizes and found a negative association between the cash conversion cycle and profitability, and Jaworski and Czerwonka (2024) meta-analysed 43 papers published between 2003 and 2018, covering almost 62,000 firms in 35 countries, and reported that macroeconomic and institutional conditions moderate the relationship. A later review that describes itself as a meta-analysis of SME studies (Supiyadi, 2023) synthesises five primary studies narratively without pooling effect sizes. To our knowledge, no study has pooled the SME evidence published since 2020 using small-sample-robust random-effects inference, reported separate estimates for the cash conversion cycle and each of its components, or documented how recent SME studies measure working capital management in the first place.

This study addresses that gap through a systematic review and meta-analysis of empirical studies of SMEs published between 2020 and 2025, reported according to the PRISMA 2020 guideline (Page et al., 2021). Drawing on capital budgeting theory and pecking order theory, it examines how the cash conversion cycle and its components—days sales outstanding, days inventory outstanding, and days payable outstanding—are associated with profitability. Indonesian SMEs were a particular interest of the search, but no Indonesian study retrieved met the measurement criteria, so Indonesia is treated here as an evidence gap rather than as an analysed context.

The study makes three contributions. First, it provides updated SME-specific pooled estimates, obtained from a documented and reproducible search and evaluated with Hartung–Knapp confidence intervals, prediction intervals, and sensitivity analyses. Second, it separates evidence of heterogeneity from evidence of moderation by testing pre-specified subgroups rather than attributing unexplained variation to particular contextual factors. Third, it documents a measurement problem in the recent literature: nearly half of the full-text reports assessed measured working capital management with perception scales or monetary levels rather than period-based ratios, which prevents their evidence from being accumulated.

The remainder of this paper is structured as follows. Section 2 reviews the theoretical foundations and empirical literature and develops the hypotheses. Section 3 describes the search, eligibility criteria, data extraction, and meta-analytic methods. Section 4 presents and discusses the results, and Section 5 concludes with implications, limitations, and suggestions for future research.

2. Literature Review

2.1 Theoretical Foundations

Two theoretical frameworks are particularly relevant to working capital management in SMEs: capital budgeting theory, which treats working capital as an investment, and pecking order theory, which explains why the financing of that investment is especially costly for small firms. Together they generate the directional predictions tested in this study and explain why the relationship need not be linear or identical across contexts.

Capital budgeting theory: Working capital components are short-term investments that must earn a return in excess of their opportunity cost (Brealey et al., 2023). Each additional day of receivables or inventory ties up funds that must be financed, so, other things being equal, a longer cash conversion cycle raises financing costs and lowers profitability (Hypotheses 1 and 3). The same framework also implies benefits. Trade credit can stimulate sales by allowing customers to verify product quality before paying and by acting as a form of price discrimination (Petersen & Rajan, 1997), and inventory protects against stock-outs and production interruptions. Because the marginal benefit of an additional day of receivables or inventory declines while its financing cost does not, the value-maximising investment lies at an interior optimum. Profitability should therefore rise and then fall as the investment increases, an inverted U-shaped relationship that has been documented for Spanish SMEs (Baños-Caballero et al., 2012) and that underlies Hypothesis 2b.

Pecking order theory: Information asymmetries make external finance more expensive than internally generated funds, so firms prefer to finance investment internally (Myers & Majluf, 1984). The asymmetries are particularly severe for SMEs, which raises the effective cost of carrying working capital and makes the internal funds released by a shorter cash conversion cycle especially valuable. Financially constrained firms accordingly have a lower optimal level of working capital investment (Baños-Caballero et al., 2014). The theory also explains why supplier credit matters to SMEs: when bank credit is rationed, delaying payments to suppliers is a substitute source of short-term finance, which predicts a positive association between days payable outstanding and profitability (Hypothesis 4). That prediction weakens where early-payment discounts are forgone or supplier relationships are damaged.

Implications for context: Both theories make the strength, and potentially the sign, of the relationship depend on parameters that differ across settings: the cost of external finance, the bargaining power of the firm relative to customers and suppliers, and the length of the operating cycle in the industry. The theories therefore predict heterogeneity across studies (Hypothesis 5), but they do not single out one contextual factor as its cause. This study accordingly treats heterogeneity as a hypothesis and the identification of specific moderators as an exploratory question.

2.2 Working Capital Management Components

Working capital management encompasses the administration of current assets and current liabilities to ensure adequate liquidity for operations while minimising capital costs. The literature relies on four principal period-based metrics.

Days Sales Outstanding (DSO), also termed the accounts receivable collection period, measures the average number of days required to collect payment from customers after a sale, calculated as $(\text{Accounts Receivable} / \text{Sales}) \times 365$. A lower DSO indicates faster collection and less capital tied up in receivables, but excessively short collection periods may constrain sales by limiting the trade credit available to customers.

Days Inventory Outstanding (DIO), or the inventory conversion period, measures the average number of days inventory is held before sale, calculated as $(\text{Inventory} / \text{Cost of Goods Sold}) \times 365$. A lower DIO suggests efficient inventory management and reduced carrying costs, whereas insufficient inventory may lead to stock-outs, production disruptions, and lost sales.

Days Payable Outstanding (DPO), or the trade payables period, measures the average number of days a firm takes to pay its suppliers, calculated as $(\text{Accounts Payable} / \text{Cost of Goods Sold}) \times 365$. A higher DPO indicates greater use of supplier credit as a financing source, but excessively delayed payments may damage supplier relationships and forfeit early-payment discounts.

The Cash Conversion Cycle ($\text{CCC} = \text{DSO} + \text{DIO} - \text{DPO}$) measures the number of days between the cash outflow for production inputs and the cash inflow from sales, and integrates the three components into a single measure of the firm's working capital position. In empirical research these metrics serve as the explanatory variables, while profitability is typically measured by return on assets (ROA), return on equity (ROE), gross or net operating profit, or earnings before interest, taxes, depreciation, and amortisation (EBITDA) scaled by assets.

2.3 Empirical Evidence: Mechanisms Linking Working Capital to SME Performance

Rather than grouping prior studies by country or by the sign of their results, this section organises the evidence by the economic mechanism through which each working capital component is expected to affect profitability. The mechanisms work in opposite directions, which explains why the same component can carry different signs in different samples.

Capital tied up in receivables and inventory must be financed, and for SMEs that finance is costly. This channel predicts negative associations for the cash conversion cycle and for inventory periods. It is supported by early evidence for Belgian firms (Deloof, 2003) and Spanish SMEs (García-Teruel & Martínez-Solano, 2007), and in the recent SME literature by negative correlations in Ghana (Braimah et al., 2021), Kosovo (Ahmeti et al., 2022), and the Spanish fish-canning industry (Rey-Ares et al., 2021), and by

negative regression coefficients for Greek SMEs (Pazarskis et al., 2024) and Polish dairy SMEs (Gołaś, 2020).

Generous credit terms can attract and retain customers, particularly when customers are themselves credit-constrained or need time to verify product quality (Petersen & Rajan, 1997). This channel predicts that longer collection periods raise profitability up to a point, after which financing costs and default risk dominate. The inverted U-shaped relationship for receivables reported for Ghanaian SMEs (Brammah et al., 2021) and for Spanish fish-canning firms (Rey-Ares et al., 2021) is consistent with this trade-off, as are the positive receivables coefficients reported for Malaysian and Polish SMEs (Gołaś, 2020; Hoang & Duong, 2020).

Delaying payments to suppliers substitutes for costly external credit, which predicts a positive association between payables periods and profitability. Positive payables coefficients are reported for Ghana, India, and Poland (Brammah et al., 2021; Chalmers et al., 2020; Gołaś, 2020). The same variable can also signal distress: less profitable firms may simply take longer to pay, so a negative association may reflect reverse causality rather than the cost of supplier credit (Deloof, 2003). Negative payables associations are reported for Greece, Croatia, and Spain (Pazarskis et al., 2024; Prša et al., 2022; Rey-Ares et al., 2021).

Inventory protects production and sales from supply and demand shocks. Where stock-outs are costly, as in some manufacturing and retail settings, holding more inventory may be associated with higher profitability, as reported for Malaysian and Indian SMEs (Chalmers et al., 2020; Hoang & Duong, 2020). In inventory-intensive food processing, by contrast, carrying and spoilage costs dominate, and inventory periods are negatively associated with profitability (Gołaś, 2020; Rey-Ares et al., 2021).

Two features of the literature complicate cumulation. First, many recent SME studies measure working capital management with questionnaire items about management practices rather than with period-based ratios computed from financial statements. None of the Indonesian studies identified by the search for this review met the measurement criteria: they relied on Likert-type questionnaires (Ardani & Sunarsi, 2023; Munir et al., 2023; Rahmiyati et al., 2024), on the monetary level of net working capital, or on qualitative designs. The same limitation applies to a Nigerian study that reports positive coefficients but does not describe how its working capital variables were measured (Okpebenyo et al., 2024). Second, estimators differ: dynamic panel GMM addresses some forms of endogeneity, whereas pooled OLS and cross-sectional designs do not, and observational designs of either kind cannot exclude reverse causality.

Which channel dominates depends on firm and market characteristics: the cost of external finance, the firm's bargaining power, customers' credit needs, and the industry's operating cycle. The financing-cost channel implies a negative association for the aggregate cash conversion cycle and for inventory, while the sales-support and supplier-

finance channels imply that receivables and payables may carry either sign. These expectations are formalised in the hypotheses below.

2.4 Hypotheses Development

H1: Cash conversion cycle. Under capital budgeting theory, a longer cash conversion cycle increases the capital that must be financed, and pecking order theory implies that this financing is particularly costly for SMEs. The financing-cost channel therefore predicts a negative association, consistent with the negative correlations and coefficients reviewed above.

H1: The cash conversion cycle is negatively associated with SME profitability.

H2: Days sales outstanding. The financing cost of receivables predicts a negative linear association, whereas the sales-support channel implies that this cost is partly offset by additional sales. Because the offsetting benefit diminishes as collection periods lengthen, the combined effect should be concave.

H2a: Days sales outstanding is negatively associated with SME profitability.

H2b: The association between days sales outstanding and SME profitability follows an inverted U-shape, indicating an optimal collection period.

H3: Days inventory outstanding. Inventory absorbs capital and incurs storage, obsolescence, and financing costs. Although inventory also acts as an operational buffer, capital budgeting theory predicts that, on average, the carrying cost outweighs this benefit.

H3: Days inventory outstanding is negatively associated with SME profitability.

H4: Days payable outstanding. Pecking order theory implies that supplier credit is valuable to SMEs whose access to bank credit is limited, predicting a positive association, although forgone discounts and reverse causality from financial distress could weaken or reverse it.

H4: Days payable outstanding is positively associated with SME profitability.

H5: Heterogeneity. Because both theories make the relationship depend on the cost of finance, bargaining power, and the operating cycle, and because these differ across the settings studied, the true association is expected to vary across studies. H5 is a hypothesis about heterogeneity, not about moderation: support for H5 shows that the association differs across contexts, not which contextual factor causes the difference. Whether pre-specified study characteristics (region and effect-size type) account for the variation is examined as an exploratory research question.

H5: The association between working capital management and SME profitability varies across studies by more than sampling error can explain.

3. Research Method

3.1 Research Design

The study is a systematic review with meta-analysis, reported in accordance with the PRISMA 2020 statement (Page et al., 2021). The review protocol was not registered in advance. The systematic review identifies, screens, and describes the eligible evidence, including the direction of reported relationships and evidence of nonlinearity; the meta-analysis pools the recoverable effect sizes to estimate the average association, quantify heterogeneity, and test whether the heterogeneity is related to pre-specified study characteristics.

3.2 Information Sources and Search Strategy

Two multidisciplinary databases were searched: the Semantic Scholar Academic Graph, through its bulk search interface, which matches terms in titles and abstracts, and the Directory of Open Access Journals (DOAJ), which indexes peer-reviewed open-access journals, including many journals from emerging economies. The Semantic Scholar query was (“working capital” | “cash conversion cycle”) + (SME | SMEs | “small and medium”) + (profitability | performance), restricted to publication years 2020–2025. The DOAJ query was “working capital” AND (SME OR SMEs OR “small and medium”) AND (profitability OR performance) AND bibjson.year:[2020 TO 2025]. Both searches were run on 24–25 September 2026, without language restrictions. The publication window was chosen to capture evidence published after the period covered by the most recent meta-analysis of the general literature, which included papers up to 2018 (Jaworski & Czerwonka, 2024). One further record, a study cited in the earlier version of this manuscript (Fernández-López et al., 2020), was added from other sources. Subscription databases such as Scopus and Web of Science were not searched, a limitation discussed in Section 5. The complete search log, including every record identified and the decision taken on it, is provided as Supplementary Material S1.

3.3 Eligibility Criteria

Studies were eligible for the systematic review if they (1) reported original quantitative empirical analysis; (2) analysed a sample of small and medium enterprises as defined by the authors; (3) measured working capital management with period- or ratio-based indicators computed from financial data—days sales outstanding, days inventory outstanding, days payable outstanding, the cash conversion cycle, or their turnover-ratio equivalents—rather than with perception (Likert-type) scales or the monetary level of net working capital; (4) related these indicators to a financial performance measure; and (5) were published between 2020 and 2025. Studies reporting the same or an overlapping dataset as another included study were counted once. Eligible studies entered the meta-analysis if they also reported an effect size that could be recovered: a zero-order correlation with its sample size, or a regression coefficient with

its standard error, t-statistic, or exact p-value, together with the number of observations and regressors.

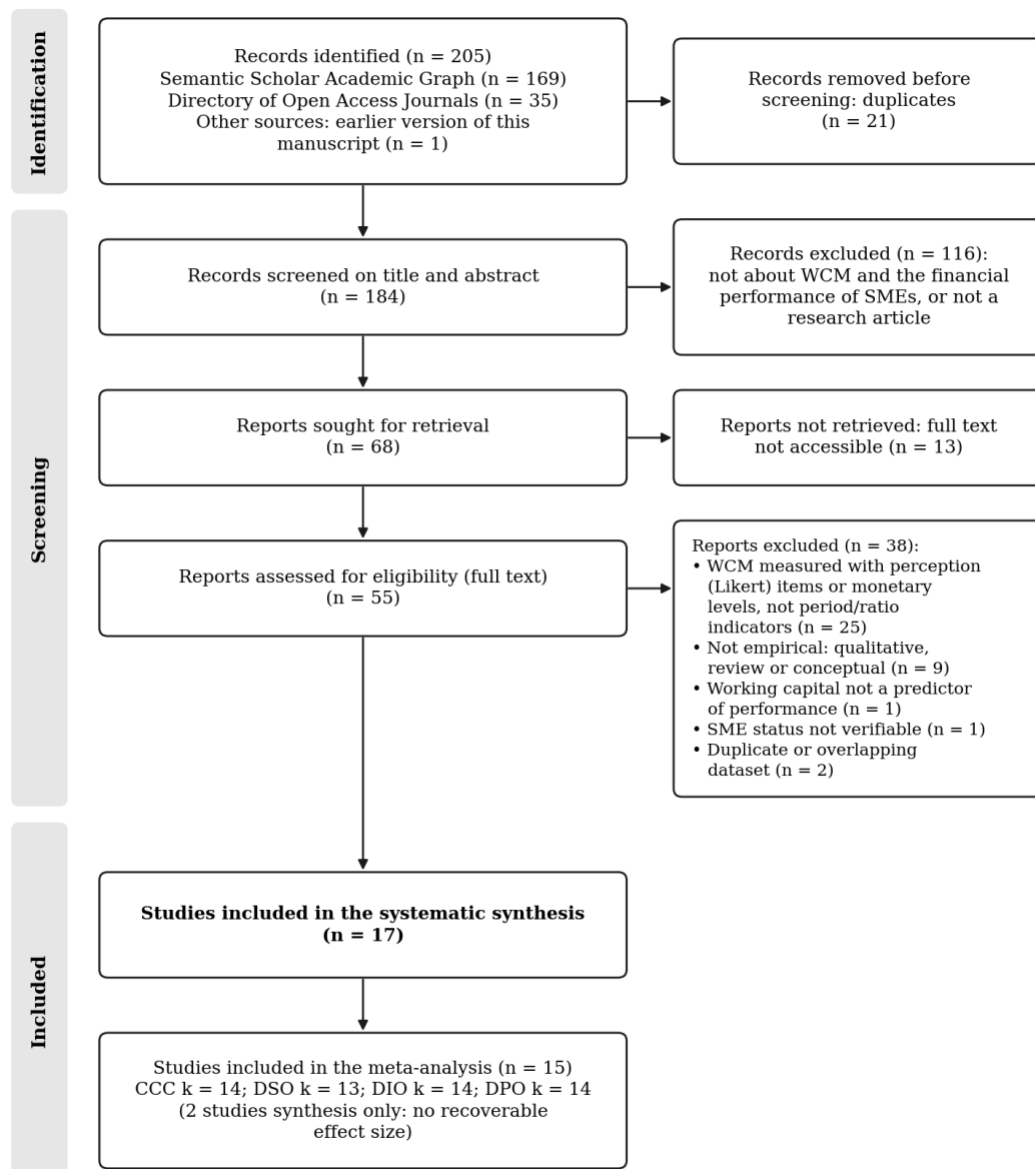
3.4 Study Selection and Data Extraction

Screening proceeded in two stages. Titles and abstracts were first screened for relevance to working capital management and the financial performance of SMEs, and the full texts of potentially relevant records were then assessed against the five criteria. For each eligible study a structured form recorded the country and sector, the number of firms and firm-year observations, the observation period, the estimator, the definitions of the working capital and performance variables, the sign and significance of each estimated relationship, any reported descriptive statistics, and all statistics needed to compute effect sizes. Values were transcribed from the tables of the source articles and checked against them. Internal inconsistencies in the reported statistics were recorded as reporting flags, for example significance markers that were incompatible with the reported standard errors, F-statistics incompatible with R^2 , or mutually inconsistent descriptive tables. Screening and extraction were not duplicated by a second independent reviewer.

3.5 Results of the Search and Selection

Figure 1 summarises the selection process. The searches identified 205 records (169 from Semantic Scholar, 35 from DOAJ, and one from other sources). After 21 duplicates were removed, 184 records were screened on title and abstract and 116 were excluded as unrelated to working capital management and SME financial performance or as not being research articles. Of the 68 reports sought for full-text assessment, 13 could not be retrieved, including the earlier-cited study of Spanish cheese producers (Fernández-López et al., 2020) and a study of Egyptian SMEs whose venue could not be verified. Of the 55 reports assessed, 38 were excluded: 25 because working capital management was measured with perception scales or monetary levels rather than period-based ratios, nine because they were qualitative, conceptual, or review papers, one because working capital was the dependent variable, one because the SME status of the sample could not be verified, and two because they reported duplicate or overlapping data. The latter were a Croatian study whose sample is a subset of a larger study by the same author (Prša, 2020; Prša et al., 2022) and a Czech study whose reported estimates are virtually identical to those of an Argentine study by overlapping authors (Arnaldi et al., 2021; Sensini & Vazquez, 2021). Seventeen studies were included in the systematic review, and 15 of these reported recoverable effect sizes and entered the meta-analysis. The two remaining studies were retained for the synthesis only, because one reports stepwise coefficients without standard errors (Mazanec, 2022) and the other presents its coefficient table in an illegible form, with reported statistics that are internally inconsistent (Ahmed & Mwangi, 2022). Table 1 describes the included studies.

Figure 1. PRISMA 2020 flow diagram of study identification, screening, and inclusion



Source: Authors' search of the Semantic Scholar Academic Graph and DOAJ (24–25 September 2026). Record-level decisions are listed in Supplementary Material S1.

Table 1. Characteristics of the 17 studies included in the systematic review

Study	Country; sector	Firms / obs.	Period	Estimator	Profitability	Use
Abdullahi et al. (2023)	Nigeria (Kaduna); manufacturing	9 / 54	2015–2020	OLS (robust SE)	ROE	M
Ahmed & Mwangi (2022)	Kenya (Garissa County)	118†	n.r.	OLS	ROA	S

Study	Country; sector	Firms / obs.	Period	Estimator	Profitability	Use
Ahmeti et al. (2022)	Kosovo; manufacturing, construction	98 / 1,078	2010–2020	Pooled OLS	ROA	M
Braimah et al. (2021)	Ghana	366 / 3,048	2007–2016	Dynamic GMM	ROA	M
Chalmers et al. (2020)	India; BSE SME IPO index	42 / 252†	2012–2017	Panel regression	ROA	M
Gólaś (2020)	Poland; dairy	57 / 456	2008–2017	System GMM	ROA	M
Hoang & Duong (2020)	Malaysia; ACE market	77 / 539	2010–2016	FE; system GMM	ROA	M
Khan et al. (2021)	GCC; listed consumer goods	136 / n.r.	2019–2020	OLS	ln gross profit	M
Mazanec (2022)	Visegrad Group; transport	1,394†	2019	Stepwise OLS	ROA	S
Morshed (2024)	Poland; multi-sector	4,891 / 48,910	2012–2021	Fixed effects	ROA	M
Oh et al. (2023)	South Korea; automotive suppliers	119 / 452	2018–2021	Fixed effects	ROA	M
Oladimeji & Aladejebi (2020)	Nigeria; mainly services	30 / 145	2014–2018	Correlation; OLS	ROA	M
Pazarskis et al. (2024)	Greece; multi-sector	101 / 705	2014–2020	Fixed effects	ROA	M
Prša et al. (2022)	Croatia; four sectors	276 / 1,380	2011–2015	Random effects	ROA	M
Rey-Ares et al. (2021)	Spain; fish canning	377 / 2,215	2010–2018	System GMM	ROA	M
Sensini & Vazquez (2021)	Argentina; agro-industrial	326 / 2,282	2012–2018	Dynamic GMM	EBITDA/TA	M
Sensini (2020)	Italy; agri-food	112 / 784	2010–2016	OLS	GOPM	M

Note: M = included in the meta-analysis; S = synthesis only (no recoverable effect size). n.r. = not reported.
† Number of usable firms in the regression sample; firm-year observations not applicable or not reported.
‡ Implied by 42 firms over six years; not stated explicitly by the authors. GOPM = gross operating profit margin; EBITDA/TA = EBITDA over total assets; FE = fixed effects; GMM = generalised method of moments.

3.6 Variables and Measures

Consistent with Section 2.2, the explanatory variables are days sales outstanding (DSO), days inventory outstanding (DIO), days payable outstanding (DPO), and the cash conversion cycle ($CCC = DSO + DIO - DPO$). Where a study reported a turnover-days equivalent, such as the net working capital conversion cycle used by Chalmers et al. (2020), it was treated as the corresponding period measure. The outcome is the study's principal profitability measure, which is return on assets in 13 of the 17 studies (defined variously with net income, EBIT, or EBITDA in the numerator); the others use return on equity, gross operating profit margin, EBITDA scaled by total assets, or the logarithm of gross profit. Effect sizes are coded so that a negative value means that a longer period is associated with lower profitability.

3.7 Effect Size Extraction and Conversion

The common effect size is the correlation between a working capital measure and profitability. Where a study reported a zero-order correlation, that value was used. Otherwise, the regression coefficient for the working capital measure in the study's main model was converted to a partial correlation, $r = t / \sqrt{(t^2 + df)}$, where t is the reported t -statistic, or the ratio of the coefficient to its standard error, or is recovered from an exact two-tailed p -value, and df is the number of observations minus the number of regressors minus one. Eight studies contributed zero-order correlations and seven contributed partial correlations.

Zero-order and partial correlations do not estimate exactly the same quantity: a partial correlation is net of the control variables in the primary model, which differ across studies, and conversions from regression statistics only approximate the corresponding bivariate correlation (Peterson & Brown, 2005). They were combined because excluding either type would discard about half of the available evidence, and because both measure the direction and strength of association on a common, bounded scale. To show whether this choice matters, effect-size type is analysed as a subgroup and each type is pooled separately (Section 4.4). The Kosovo study illustrates why the distinction matters: its zero-order correlation between the cash conversion cycle and ROA is negative ($r = -0.209$), while its regression coefficient with controls is positive but reported only as 0.000 without a standard error (Ahmeti et al., 2022). The correlation is used in the meta-analysis, and the regression sign is recorded in Table 3.

Each study contributes at most one effect size per working capital measure. Where a study reported several profitability measures, the one closest to return on assets was used. The Korean study reports parallel analyses for suppliers to two automakers whose supplier bases overlap, so only the larger subsample was used (Oh et al., 2023). Sample sizes are the firm-year observations underlying each statistic. Because repeated observations of the same firm are not independent, this choice overstates precision, and all analyses were repeated using the number of firms as the sample size.

3.8 Pooling Model

Correlations were transformed to Fisher's z , $z = 0.5 \cdot \ln[(1 + r) / (1 - r)]$, pooled with inverse-variance weights, and back-transformed for reporting. The sampling variance of each transformed effect is $1 / (n - 3)$. The random-effects model, with the between-study variance τ^2 estimated by the DerSimonian and Laird (1986) method, is reported as the main result because the studies differ in country, sector, period, and estimator, so a single common true effect cannot be assumed. The standard random-effects confidence interval can be too narrow when the number of studies is small and heterogeneity is high, so Hartung–Knapp–Sidik–Jonkman confidence intervals, which use a t -distribution with $k - 1$ degrees of freedom and a variance adjusted for the observed dispersion, are also reported (IntHout et al., 2014; Knapp & Hartung, 2003). A 95%

prediction interval, which describes the range within which the true association in a new comparable setting is expected to fall, is reported alongside each estimate (Riley et al., 2011). Fixed-effect estimates are shown for comparison.

3.9 Heterogeneity, Subgroup, Sensitivity, and Small-Study Analyses

Heterogeneity was assessed with Cochran's Q statistic and summarised by I^2 , the percentage of total variation attributable to between-study differences rather than sampling error, and by τ^2 (Higgins & Thompson, 2002). Two study characteristics were specified in advance as candidate sources of heterogeneity: region (European versus non-European samples) and effect-size type (zero-order versus partial correlation). Differences between subgroups were tested with the between-subgroup Q statistic. Other plausible sources, such as industry, firm size, or estimator, could not be tested because too few studies share each category. Sensitivity analyses repeated the pooling using firms rather than firm-years as the sample size, excluding the six studies with reporting flags, restricting the sample to asset-scaled profitability measures, and omitting each study in turn. Small-study effects, which may indicate publication bias, were assessed with Egger's regression test (Egger et al., 1997), and the precision-effect test (PET) estimate, the predicted effect of a study with infinite precision, was used as a bias-adjusted benchmark (Stanley & Doucouliagos, 2014). With 13 or 14 studies per measure, these tests are feasible but have limited power and are interpreted cautiously.

3.10 Hypotheses Restated for the Meta-Analysis

Hypotheses 1 to 4 are supported if the pooled random-effects correlation has the predicted sign and both the standard and the Hartung–Knapp 95% confidence intervals exclude zero; they are described as partially supported if only the standard interval excludes zero. Hypothesis 5 is supported if Cochran's Q rejects homogeneity and I^2 indicates substantial heterogeneity. Support for Hypothesis 5 is not interpreted as evidence that any particular factor moderates the relationship; that question is addressed only by the subgroup tests. Hypothesis 2b cannot be tested by pooling, because quadratic turning points have no common effect-size metric across studies that estimate linear models, and it is evaluated in the systematic review.

4. Results and Discussion

4.1 Characteristics of the Included Studies

The 17 included studies cover 15 country or regional contexts: eight analyse European samples (Croatia, Greece, Italy, Kosovo, Poland, Spain, and the Visegrad Group) and nine analyse samples from Africa, Asia, the Middle East, and Latin America (Argentina, the Gulf Cooperation Council, Ghana, India, Kenya, Malaysia, Nigeria, and South Korea). Sample sizes range from 9 to 4,891 firms, and the observation periods run from 2007 to 2021. Four studies use dynamic or system GMM estimators, five use fixed-

or random-effects panel models, one uses an unspecified panel regression, and seven rely on OLS or correlation analysis (Table 1). Southeast Asia is represented only by Malaysia, and no Indonesian study met the eligibility criteria.

Table 2 reports the descriptive statistics published by the 12 studies that provide means for the working capital variables, each with its source. Across these studies the median of the reported mean cash conversion cycle is 107 days, ranging from 15 days among Polish dairy processors (Gołaś, 2020) to 168 days among Kosovar SMEs (Ahmeti et al., 2022). The median mean collection period is 89 days (range 24–207), the median inventory period is 84 days (range 19–149), and the median payables period is 65 days (range 28–116). Mean profitability also varies widely, and in three samples average ROA is negative. These differences in operating cycles and profitability are themselves a reason to expect the working capital–profitability relationship to differ across samples.

Table 2. Mean working capital periods and profitability reported in the included studies

Study	DSO (days)	DIO (days)	DPO (days)	CCC (days)	Mean profitability
Ahmeti et al. (2022)	121.8	149.4	103.0	168.3	0.090 (ROA)
Braimah et al. (2021)	147.8	98.0	88.2	157.6	0.169 (ROA)
Chalmers et al. (2020)	96.5	32.3	59.8	316.1†	0.038 (ROA)
Gołaś (2020)	23.7	19.4	28.3	14.9	n.r.
Hoang & Duong (2020)	129.9	84.0	86.9	121.6	−0.166 (ROA)
Oh et al. (2023)	59.0	42.2	52.4	48.8	−0.001 (ROA)
Oladimeji & Aladejebi (2020)	207.2	49.9	38.6	18.1	−0.072 (ROA)
Pazarskis et al. (2024)	114.0	108.6	93.9	128.7	0.047 (ROA)
Prša et al. (2022)	63.2	n.r.	70.9	n.r.	0.089 (ROA)
Rey-Ares et al. (2021)	80.7	98.2	47.6	128.8	0.040 (ROA)
Sensini (2020)	82.2	141.6	116.3	53.4	0.281 (GPM)
Sensini & Vazquez (2021)	74.5	78.2	46.8	93.1	0.080 (EBITDA/TA)
Median of study means	89.3	84.0	65.4	107.4‡	—

Note: Values are the sample means reported by each study (Braimah et al., 2021, Table 3; Ahmeti et al., 2022, descriptive statistics; Chalmers et al., 2020; Gołaś, 2020; Hoang & Duong, 2020, Table 1; Oh et al., 2023, Hyundai supplier sample; Oladimeji & Aladejebi, 2020; Pazarskis et al., 2024; Prša et al., 2022; Rey-Ares et al., 2021, Table 2; Sensini, 2020; Sensini & Vazquez, 2021, Table 2). Profitability is expressed as a ratio; values reported in percent were divided by 100. n.r. = not reported. † Net working capital conversion cycle. ‡ Excludes the net working capital conversion cycle of Chalmers et al. (2020). Five included studies are not listed because they report no means for these variables or report descriptive statistics that are internally inconsistent or implausible (e.g., a mean cycle above 1,500 days).

4.2 Direction of the Reported Relationships

Table 3 records the sign and significance of each relationship in the main model of each study. For the cash conversion cycle, nine studies report a significant negative relationship with profitability, five report a significant positive relationship (Abdullahi et al., 2023; Ahmed & Mwangi, 2022; Ahmeti et al., 2022; Hoang & Duong, 2020; Mazanec, 2022), one reports a non-significant estimate, and two do not estimate it. The components are even less consistent. Inventory periods are negative in most studies, but receivables and payables periods carry positive, negative, and nonlinear signs in roughly equal numbers. Such a tally treats a nine-firm sample and a panel of almost 49,000 firm-years as equally informative, however, and it cannot say whether the disagreement exceeds sampling error. The meta-analysis addresses both limitations.

Table 3. Sign of the estimated relationships between working capital measures and profitability

Study — context	DSO	DIO	DPO	CCC
Abdullahi et al. (2023) — Nigeria	n.r.	n.r.	—	+
Ahmed & Mwangi (2022) — Kenya	—	n.s.	+	+
Ahmeti et al. (2022) — Kosovo	+	—	+	+§
Braimah et al. (2021) — Ghana	∩	—	+	—
Chalmers et al. (2020) — India	—	+	+	—†
Gołaś (2020) — Poland	+	—	+	—
Hoang & Duong (2020) — Malaysia	+	+	—	+
Khan et al. (2021) — GCC	—	—	(—)	—
Mazanec (2022) — Visegrad Group	n.s.	n.s.	—	+
Morshed (2024) — Poland	—	—	—	—
Oh et al. (2023) — South Korea	(—)	—	(+)	—
Oladimeji & Aladejebi (2020) — Nigeria	(+)	(—)	(+)	n.r.
Pazarskis et al. (2024) — Greece	—	—	—	— (∩)
Prša et al. (2022) — Croatia	(+)	—	—	n.r.
Rey-Ares et al. (2021) — Spain	∩	U	(—)	(+)
Sensini (2020) — Italy	n.r.	n.r.	n.r.	—
Sensini & Vazquez (2021) — Argentina	(—)	—	—	—

Note: Signs refer to the main regression model of each study. — / + = negative / positive and significant at the 10% level or better; (—) / (+) = not significant; ∩ = inverted U-shape; U = U-shape; n.s. = not significant or not retained by stepwise selection; n.r. = not reported. † Net working capital conversion cycle. § Positive in the regression with controls, whereas the zero-order correlation is negative ($r = -0.209$). (∩) Quadratic specification indicates a concave relationship.

4.3 Meta-Analytic Results

Table 4 lists the effect sizes extracted from the 15 studies in the meta-analysis, and Table 5 reports the pooled estimates. Figure 2 shows the study-level correlations for the cash conversion cycle.

Table 4. Effect sizes extracted from the studies included in the meta-analysis

Study	Effect-size source	N	CCC	DSO	DIO	DPO
Abdullahi et al. (2023) [†]	Zero-order r	54	−0.08 8	—	—	0.059
Ahmeti et al. (2022)	Zero-order r	1,078	−0.20 9	−0.10 8	−0.18 0	−0.01 3
Braimah et al. (2021)	Zero-order r	3,048	−0.14 2	0.111	−0.05 1	0.098
Chalmers et al. (2020)	Zero-order r	252	−0.12 0	−0.11 0	0.112	−0.06 0
Golaś (2020)	Partial r: exact p (GMM)	456	−0.10 2	0.099	−0.10 6	0.111
Hoang & Duong (2020)	Partial r: exact p (GMM; FE for DIO)	462 / 539	0.095	—	0.113	—
Khan et al. (2021) [†]	Partial r: t (OLS)	136	−0.41 0	−0.17 3	−0.41 3	−0.02 5
Morshed (2024) [†]	Partial r: t (FE)	48,910	−0.01 5	−0.01 8	−0.01 4	−0.01 9
Oh et al. (2023)	Zero-order r	452	−0.01 0	−0.16 8	−0.11 1	−0.08 5
Oladimeji & Aladejebi (2020) [†]	Zero-order r	9 / 60	−0.05 6	0.049	−0.26 9	−0.01 1
Pazarskis et al. (2024)	Partial r: t (FE)	705	−0.21 7	−0.20 8	−0.19 9	−0.16 0
Prša et al. (2022)	Partial r: β/SE (RE)	1,380	—	0.006	−0.07 8	−0.07 8
Rey-Ares et al. (2021)	Zero-order r	1,946 / 2,106	−0.17 5	−0.06 9	−0.28 1	−0.19 8
Sensini & Vazquez (2021) [†]	Partial r: β/SE (GMM)	2,282	−0.02 4	−0.01 9	−0.04 9	−0.03 5
Sensini (2020) [†]	Zero-order r	784	−0.37 6	−0.43 8	−0.27 5	−0.43 0

Note: N = firm-year observations underlying the statistic (Chalmers et al., 2020: implied; Oladimeji & Aladejebi, 2020: 9 statements for CCC and DIO, 60 for DSO and DPO; Hoang & Duong, 2020: 462 for CCC, 539 for DIO; Rey-Ares et al., 2021: 1,946 for CCC and DIO, 2,106 for DSO and DPO). Partial correlations are computed as $r = t / \sqrt{(t^2 + df)}$. Khan et al. (2021) use the logarithm of gross profit, Sensini (2020) gross operating profit margin, and Abdullahi et al. (2023) ROE; Abdullahi et al. (2023) report

Spearman correlations. — = not reported. † Study with reporting flags (inconsistent significance markers, sample sizes, or descriptive statistics), excluded in the sensitivity analysis in Table 6.

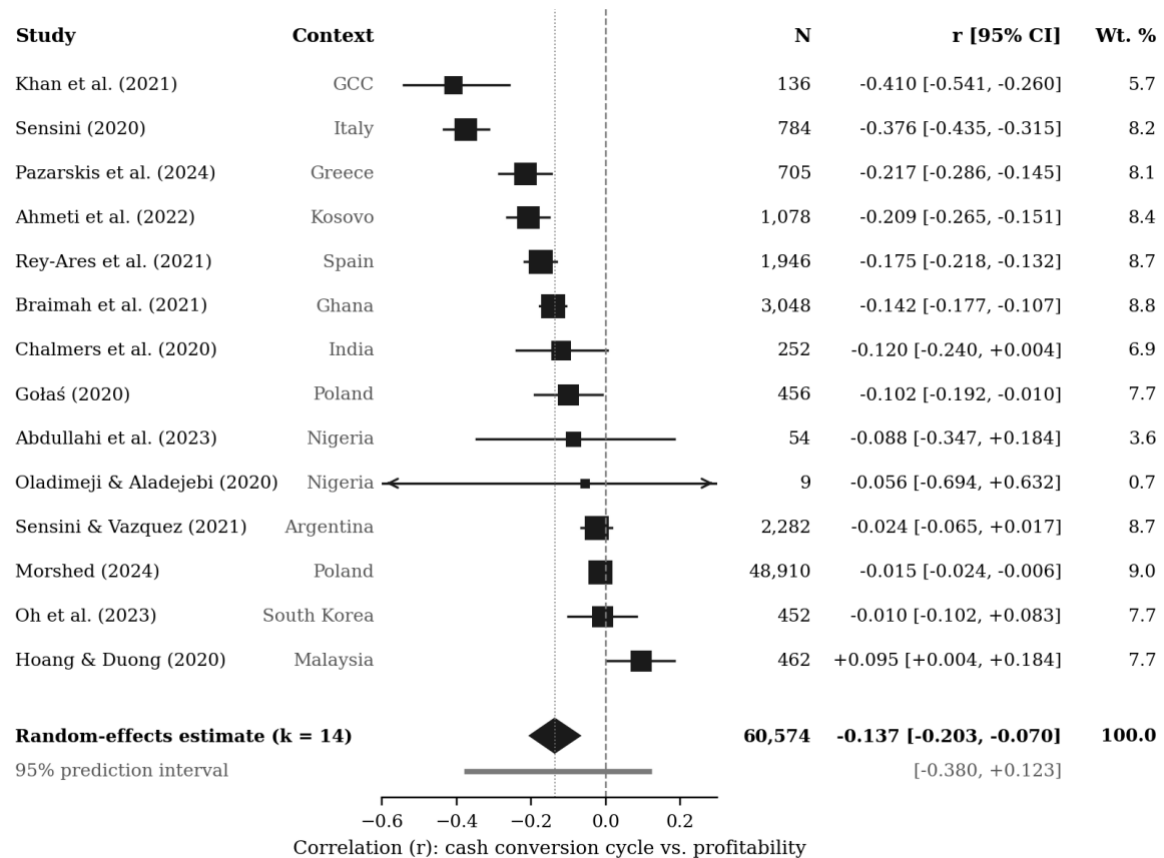
Table 5. Pooled correlations between working capital measures and SME profitability

Measure	k	N	FE r	RE r [95% CI]	HK 95% CI	H K p	95% PI	Q	I ²
Cash conversion cycle	1 4	60,57 4	-0.03 9	-0.137 [-0.203, -0.070]	[-0.219, -0.053]	0.0 04	[-0.380, 0.123]	286. 7	95.5 %
Days sales outstanding	1 3	61,64 9	-0.02 3	-0.084 [-0.147, -0.021]	[-0.177, 0.010]	0.0 76	[-0.321, 0.162]	272. 4	95.6 %
Days inventory outstanding	1 4	61,97 7	-0.03 7	-0.117 [-0.178, -0.055]	[-0.200, -0.032]	0.0 11	[-0.349, 0.129]	284. 3	95.4 %
Days payable outstanding	1 4	61,70 3	-0.02 8	-0.071 [-0.135, -0.007]	[-0.156, 0.014]	0.0 94	[-0.312, 0.178]	287. 7	95.5 %

Note: k = number of studies; N = total firm-year observations; FE = fixed-effect; RE = random-effects (DerSimonian–Laird); HK = Hartung–Knapp–Sidik–Jonkman; PI = prediction interval. Correlations are pooled on Fisher's z scale and back-transformed. All Q statistics have $p < 0.001$. Negative values indicate that a longer period is associated with lower profitability.

Cash conversion cycle (H1). The random-effects correlation between the cash conversion cycle and profitability is -0.137 (95% CI $[-0.203, -0.070]$, $p < 0.001$), and the Hartung–Knapp interval also excludes zero ($[-0.219, -0.053]$, $p = 0.004$), so Hypothesis 1 is supported. The association is modest. A correlation of -0.137 corresponds to the cash conversion cycle accounting for about 1.9% of the variance in profitability; on average, an SME whose cycle is one standard deviation longer than that of a comparable firm would be expected to have profitability about 0.14 standard deviations lower. The fixed-effect estimate is smaller still (-0.039), because it gives most of the weight to the largest study (Morshed, 2024), whose estimate is close to zero. The prediction interval, $[-0.380, 0.123]$, shows that in a new setting comparable to those studied the association could range from moderately negative to slightly positive. The evidence therefore supports a small average negative association, not a general rule that shorter cycles raise profitability everywhere.

Figure 2. Forest plot of the correlation between the cash conversion cycle and SME profitability



Source: Authors' calculations from the studies in Table 4. Squares are study estimates (size proportional to random-effects weight) with 95% confidence intervals; the diamond is the random-effects estimate; the grey bar is the 95% prediction interval.

Components (H2a, H3, H4). Days inventory outstanding has a pooled correlation of -0.117 (95% CI $[-0.178, -0.055]$; Hartung–Knapp $[-0.200, -0.032]$, $p = 0.011$), so Hypothesis 3 is supported, again with a modest magnitude. Days sales outstanding has a pooled correlation of -0.084 (95% CI $[-0.147, -0.021]$), but the Hartung–Knapp interval includes zero ($[-0.177, 0.010]$, $p = 0.076$), so Hypothesis 2a is only partially supported. The individual estimates for receivables range from -0.438 to $+0.111$, consistent with the offsetting financing-cost and sales-support channels described in Section 2.3. For days payable outstanding the pooled correlation is -0.071 (95% CI $[-0.135, -0.007]$; Hartung–Knapp $[-0.156, 0.014]$, $p = 0.094$). This is the opposite of the positive association predicted by Hypothesis 4, which is not supported. On average, the evidence does not indicate that SMEs with longer payment periods are more profitable. If anything, the weak

negative association is consistent with the possibility that less profitable firms pay more slowly (Deloof, 2003).

4.4 Heterogeneity, Subgroup, and Sensitivity Analyses

Heterogeneity is substantial for every measure. For the cash conversion cycle Cochran's Q is 286.7 ($p < 0.001$) and I^2 is 95.5%; for the components I^2 ranges from 95.4% to 95.6% (Table 5). Part of this reflects the use of firm-years as the sample size, which overstates precision, but heterogeneity remains substantial when firms are used instead ($I^2 = 76.6\%$ for the cash conversion cycle; Table 6). Hypothesis 5 is therefore supported: the studies estimate associations that differ by more than sampling error can explain.

Support for Hypothesis 5 does not identify what causes the differences. Neither of the two pre-specified subgroup variables accounts for them (Table 6). The pooled correlation is -0.184 in European samples and -0.088 in non-European samples, but the difference is not statistically significant (Q between = 1.61, $p = 0.205$). Zero-order correlations yield a larger pooled estimate than partial correlations (-0.172 versus -0.092), consistent with control variables absorbing part of the bivariate association, but this difference is not significant either (Q between = 2.16, $p = 0.142$). With six to eight studies per subgroup these tests have limited power, so the absence of a significant difference does not show that region or effect-size type is irrelevant. It does mean that the present evidence cannot attribute the heterogeneity to them. Other plausible sources could not be tested and should be read as hypotheses for future work: institutional differences in access to bank credit and in payment norms; industry operating cycles, which range from a mean cash conversion cycle of 15 days in dairy processing to more than 150 days in some samples (Table 2); the size distribution of firms within the SME category; the definition of profitability; the estimator; financial data collected through questionnaires rather than from audited statements (Sensini & Vazquez, 2021); and observation periods that include crises such as the COVID-19 pandemic (Khan et al., 2021; Morshed, 2024).

Table 6. Subgroup, sensitivity, and small-study analyses for the cash conversion cycle

Analysis	k	RE r [95% CI]	HK p	I^2
Main analysis	14	-0.137 [$-0.203, -0.070$]	0.004	95.5%
<i>Subgroups (pre-specified)</i>				
European samples	6	-0.184 [$-0.301, -0.062$]	0.017	97.7%
Non-European samples	8	-0.088 [$-0.173, -0.001$]	0.152	86.7%
Difference: Q between = 1.61, $p = 0.205$				
Zero-order correlations	8	-0.172 [$-0.247, -0.096$]	0.005	87.5%
Partial correlations	6	-0.092 [$-0.167, -0.015$]	0.231	91.9%
Difference: Q between = 2.16, $p = 0.142$				
<i>Sensitivity</i>				

Analysis	k	RE r [95% CI]	HK p	I ²
Firms instead of firm-years as sample size	14	−0.141 [−0.221, −0.060]	0.004	76.6%
Excluding six studies with reporting flags	8	−0.117 [−0.176, −0.057]	0.016	84.9%
Asset-scaled profitability measures only	11	−0.094 [−0.153, −0.034]	0.011	93.9%
Leave-one-out (range of 14 estimates)	13	−0.156 to −0.113	≤ 0.009	91.4– 95.8%
<i>Small-study effects</i>				
Egger test, all studies	14	intercept −3.42, p = 0.023		
Egger test, excluding Morshed (2024)	13	intercept −0.56, p = 0.778		
PET estimate, all studies	14	−0.007 (p = 0.716)		
PET estimate, excluding Morshed (2024)	13	−0.123 (p = 0.084)		

Note: RE = random-effects; HK = Hartung–Knapp–Sidik–Jonkman. Europe: Ahmeti et al. (2022), Golaś (2020), Morshed (2024), Pazarskis et al. (2024), Rey-Ares et al. (2021), Sensini (2020). The asset-scaled analysis excludes Abdullahi et al. (2023), Khan et al. (2021), and Sensini (2020). PET = precision-effect test (Stanley & Doucouliagos, 2014), the estimated correlation for a hypothetical study with infinite precision.

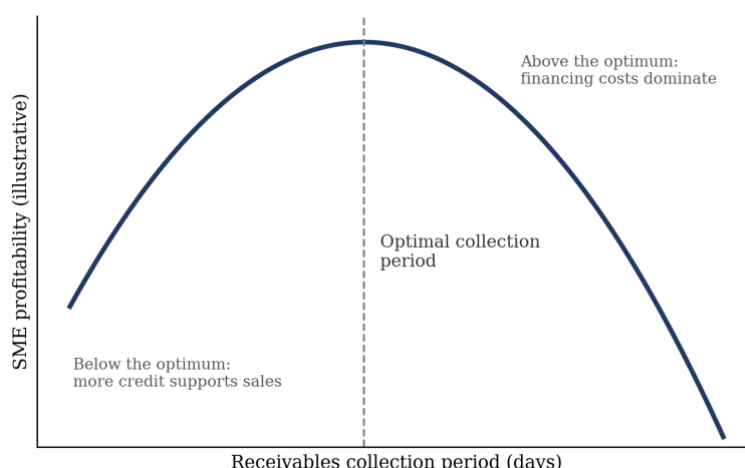
The pooled cash conversion cycle estimate is robust to the other sensitivity analyses. It remains negative and significant under the Hartung–Knapp method when firms replace firm-years as the sample size (−0.141), when the six studies with reporting flags are excluded (−0.117), when the analysis is restricted to asset-scaled profitability measures (−0.094), and when any single study is omitted (range −0.156 to −0.113). The estimate based only on partial correlations is negative, but its Hartung–Knapp interval includes zero. For the components, the inventory association remains negative in every sensitivity analysis and is significant under the Hartung–Knapp method in all except the partial-correlation subset and the analysis excluding flagged studies. The receivables and payables associations are not significant under the Hartung–Knapp method in any sensitivity analysis, apart from one leave-one-out estimate for receivables (full results in Supplementary Material S1).

The small-study analyses call for caution. Egger's test indicates funnel-plot asymmetry (p = 0.023), and the PET estimate, −0.007, is close to zero. Both results depend on a single study, however. The very large Polish panel (Morshed, 2024), with 48,910 firm-years, reports a correlation near zero; it therefore dominates any analysis that extrapolates to infinite precision, and its descriptive statistics carry reporting flags. Without it, there is no evidence of asymmetry (p = 0.778), and the PET estimate is −0.123. The evidence is therefore compatible with a modest negative association, but the possibility that the pooled estimate overstates the true average cannot be excluded.

4.5 Nonlinear Relationships

Hypothesis 2b concerns a nonlinear relationship that cannot be pooled, so it is evaluated from the systematic review. Both included studies that estimated a quadratic receivables term report an inverted U-shape: Ghanaian SMEs (Brimmah et al., 2021) and Spanish fish-canning firms (Rey-Ares et al., 2021). The Spanish study also reports a U-shaped relationship for inventory periods, and a concave relationship between the cash conversion cycle and ROA is reported for Greek SMEs (Pazarskis et al., 2024). Inverted U-shaped relationships are also reported in the abstracts of two studies whose full texts could not be retrieved, for 2,122 Indian SMEs (Ahangar, 2021) and for financially constrained Thai shipping SMEs (Kotcharin & Jantadej, 2024), and in earlier evidence for Spanish SMEs (Baños-Caballero et al., 2012). Hypothesis 2b is therefore supported by the available evidence, although that evidence consists of only two included studies. The pattern is illustrated in Figure 3.

Figure 3. Stylised inverted U-shaped relationship between the receivables collection period and SME profitability



Source: Authors' illustration of the pattern reported by Brimmah et al. (2021) and Rey-Ares et al. (2021). The curve is illustrative and does not represent estimated coefficients.

A concave relationship helps to reconcile the conflicting linear estimates in Table 3. Where most firms in a sample extend more credit, or hold more inventory, than the optimum, a linear model will estimate a negative association; where most firms operate below it, the estimate will be positive. Because the optimum depends on customers' credit needs, the cost of finance, and the operating cycle of the industry, the same underlying trade-off can produce different signs in different samples.

The negative associations for the cash conversion cycle and inventory periods are consistent with the financing-cost channel implied by capital budgeting theory and with the high cost of external finance for SMEs emphasised by pecking order theory. They are also consistent in direction with the earlier meta-analyses of firms of all sizes (Jaworski & Czerwonka, 2024; Singh et al., 2017). The weak and unstable pooled associations for receivables and payables are consistent with the view that these components operate through offsetting channels. Longer collection periods raise financing costs but can support sales, and longer payment periods provide supplier finance but can also signal distress. The negative pooled association for payables runs against the pecking order prediction, which suggests that in the samples studied the costs of delayed payment, or the tendency of less profitable firms to pay slowly, outweigh the value of supplier credit.

The primary studies are observational, and most estimate associations that may reflect reverse causality or omitted factors. Profitable firms may be able to collect receivables and turn over inventory faster, rather than faster collection causing higher profits, and demand shocks can move inventory, receivables, and profits together. Dynamic GMM estimators address some of these concerns, but only four studies use them as their main estimator. The results should therefore be read as showing that SMEs with shorter cash conversion cycles tend, on average, to be somewhat more profitable, not that shortening the cycle will by itself raise profitability.

Given the modest average association and the wide prediction interval, the findings do not support a general prescription to minimise working capital. Rather, they suggest that SME managers should treat the cash conversion cycle as a diagnostic indicator and seek the level that suits their industry, business model, and financing position. Inventory is the component for which the evidence of a negative association is most consistent, so reviewing inventory holding periods is a reasonable priority, particularly in inventory-intensive sectors such as food processing, while keeping enough stock to avoid lost sales. Credit terms to customers should be evaluated as a sales instrument, since the evidence of an interior optimum means that tightening credit can reduce sales where customers depend on it. Stretching payments to suppliers is not a reliable route to higher profitability and should be weighed against forgone discounts and supplier relationships. Working capital that is too low also carries risks, including stock-outs, lost customers, and liquidity shortfalls. The aim is optimisation, not minimisation.

Twenty-five of the 55 full-text reports assessed were excluded because working capital management was measured with perception scales or monetary levels, and no Indonesian study retrieved met the measurement criteria. Evidence from such studies cannot be compared or pooled with evidence based on period-based ratios. For the SME literature to cumulate, studies should compute working capital periods from financial statements and report correlation matrices, or coefficients with standard errors, together with the number of firms and observations.

5. Conclusion and Suggestions

This systematic review and meta-analysis of SME studies published between 2020 and 2025 finds that a longer cash conversion cycle is associated with lower profitability. The association is statistically robust but modest ($r = -0.137$ across 14 studies, about 2% of the variance in profitability), so Hypothesis 1 is supported. Days inventory outstanding shows a similar association, supporting Hypothesis 3. The association for days sales outstanding is negative but not robust, so Hypothesis 2a is only partially supported, and the association for days payable outstanding is weakly negative rather than positive, so Hypothesis 4 is not supported. The two included studies that tested a quadratic receivables term both report an inverted U-shape, consistent with Hypothesis 2b. Heterogeneity is substantial, supporting Hypothesis 5, but neither region nor effect-size type explains it, so the evidence establishes that the relationship varies across contexts without identifying the factors responsible.

For practice, the findings support managing working capital toward a level that fits the firm's industry and financing position, with particular attention to inventory holding periods, rather than minimising the cash conversion cycle. Because the evidence is observational and the average association is small, working capital management should be seen as one lever on profitability among many, not as a guaranteed route to higher returns.

The study has several limitations. First, although the search expanded the evidence base from the three studies pooled in the earlier version of this manuscript to 14 for the cash conversion cycle, this remains a modest number of studies. Statistical power for the subgroup and small-study tests is therefore limited, the prediction interval is wide, and the pooled estimates should be regarded as preliminary evidence that needs confirmation as more studies accumulate. Second, the search covered two open databases and did not include Scopus or Web of Science, 13 reports could not be retrieved, and screening was not duplicated by an independent reviewer, so relevant studies may have been missed. Third, several included studies carry reporting flags, one very large study dominates the fixed-effect and small-study analyses, and firm-year observations are not independent. The sensitivity analyses address these problems but cannot remove them. Fourth, combining zero-order and partial correlations, although supported by the subgroup test, discards the endogeneity corrections of the primary models. Fifth, the evidence covers 15 country contexts but includes no Indonesian study and only one Southeast Asian study, so generalisation to Indonesian SMEs is not warranted.

Future research should build primary panel evidence for markets absent from this review, Indonesia in particular, using working capital periods computed from financial statements rather than perception scales. Studies should report correlation matrices or coefficients with standard errors so that their findings can be cumulated, and should estimate nonlinear specifications and use designs that support causal inference. A replication of this review in subscription databases, with independent double screening,

would test the robustness of the present estimates, and a larger evidence base would allow the moderators suggested in Section 4.4 to be tested formally.

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