

Chapter 1

Working Capital Minded Supply Chain and Procurement Management in Manufacturing Operations

ABSTRACT

The importance of working capital management to businesses is undeniable as many collapses were not caused by lack of profitability but, rather, by shortages in cash (Nuhiu and Dermaku, 2017). An increased focus on working capital has been noted since the financial downturn of 2007-2008 because of that the access to borrowed capital became more expensive. This results in prompting businesses to pass on the burden of working capital to the downstream supply chain by delaying payments (Duggal and Budden, 2012; Haron and Nomran, 2016). In the UK alone, 50,000 Small and Medium Enterprises (SME) go bankrupt each year as they run out of cash from delayed customer payments (Bounds and Moules, 2019). The general objective of working capital management is to reduce it to a point where current assets, which are made up of inventories and accounts receivable be financed from current liabilities, which are made of accounts payable (Sagner, 2014). This usually is overlooked by practitioners who tend to be measured based on cost and operational efficiency, rather than on the cash impact of their daily activities (DeSmet, 2018). Hence, the purpose of this chapter is to identify mainly the supply chain and procurement practices that consider working capital. This chapter summarises findings from the literature in a working capital maturity matrix, listing the practices that impact the working capital. Practices are associated with a “lagging” organisation when their impact on working capital was considered negative by the source. On the other hand, the practices that are associated with a “leading” organisation when their impact on working capital was considered positive. Here, the term negative and positive are used qualitatively to describe “malpractice” and “best practice”, respectively. This distinction is important as quantitative negative impact on working capital would improve performance.

Keywords: Working Capital; Working Capital Management; Supply Chain; Procurement; Manufacturing; Liquidity; Maturity

1.1 Introduction

1.1.1 Business Problem

Working capital management (WCM) has gained greater interest since the financial downturn of 2007-2008 (Duggal and Budden, 2012; Haron and Nomran, 2016). Working capital (WC) was initially viewed as a positive element on a company's balance sheet, a belief that was pushed by the banking sector who is lending capital with interest (Sagner, 2014). Today's approach is to reduce working capital to a point where current assets can be financed from current liabilities (Sagner, 2014). The importance of working capital management to businesses is undeniable. The saying "cash is king" (DeSmet, 2018; Templar, 2019) appears to hold true as recent collapses in businesses were not caused by lack of profitability but, rather, by shortages in cash (Nuhiu and Dermaku, 2017).

Generally, the connections between supply chain and procurement (SC&P) management with financial performance and metrics are largely overlooked by practitioners. They tend to measure it on various differing and sometimes opposing operational efficiency measures, rather than on financial performance indicators (DeSmet, 2018).

1.1.1.1 Working Capital

Working capital is a financial result representing the capital or cash generated by business operations. Indeed, working capital can be deducted from a business' annual report balance sheet by summing accounts receivable (AR) and inventory less accounts payable (AP). Working capital is managed with the objective to sustainably reduce AR and inventory whilst increasing AP. Working capital is often metaphorically referred to as the "oil in the engine" (DeSmet, 2018; Templar, 2019) to signify that a business running out of cash is a business that will cease to function.

1.1.1.2 Supply Chain and Procurement

Both supply chain and procurement strongly impact the working capital of a business (DeSmet, 2018). Supply chain (SC) and by extension supply chain management (SCM) are relatively recent concepts. The term "Supply Chain" takes its roots from consultancy in the early 1980s (Christopher, 2016). It has been described as an extension of logistics management (DeSmet, 2018; Christopher, 2016) that seeks to coordinate the flow of goods and information in the supply chain (Christopher, 2016) towards the integration of

other business processes. The “links” of the supply “chain” represent suppliers and customers exchanging materials, information and cash. The influence of supply chain activities on AR, inventories and AP is relevant to working capital.

Procurement function manages the external spend of a business and hence been developed as a strategic function since 1990s. Leading strategic procurement is a function that has a strong influence on a company’s strategy. Its scope of activities includes, amongst others, end-to-end supply chain management and supplier management (Mena, Van Hoek and Christopher, 2018). The influence of procurement on AP and inventories make it relevant to working capital.

1.1.1.3 Manufacturing

Manufacturing has been chosen as a context of analysis for the purpose of this chapter, as it includes the complexity around making inventories in increasingly demanding environments in terms of shortening product life-cycles and having greater variety (Christopher, 2016). The influence of manufacturing on inventory is relevant to working capital.

1.1.2 Research Objectives and Questions

The research seeks to address the research question: “What does best practice working capital management involve for supply chain and procurement functions in a manufacturing environment?” preceded by research objectives (Saunders, Lewis and Thornhill, 2012).

1.1.2.1 Research Questions

- RQ 1 What are the relevant trends in working capital management?
- RQ 2 What are the commonly accepted and effective working capital management practices?
- RQ 3 What are the implications of working capital management for the procurement and supply chain?
- RQ 4 What are the common gaps in best practice working capital management?
- RQ 5 What implementation framework can be established for best practice working capital management?

1.1.2.2 Research Objectives

Research objectives (ROs) were determined and numbered as follows:

- RO 1 Review the existing academic and practitioner literature to identify the relevant trends related to working capital management
- RO 2 Identify the common and effective working capital management practices
- RO 3 Identify the working capital management implications on the procurement and supply chain functions
- RO 4 Discuss the common gaps in best practice working capital management
- RO 5 Provide a maturity model framework for best practice working capital management for supply chain and procurement functions

1.1.3 Justification and Scope of the Research

1.1.3.1 Importance of Working Capital Management

Working capital is a financial result that tends to be overlooked when business growth and profitability are high (Davies and Merin, 2014; DeSmet, 2018). Due to the cross-functional nature of working capital management, it is often absent as a function of business (Sagner, 2014). Working capital is often addressed when businesses are prompted by poor performance, year- end window-dressing practices such as pushing supplier payments and inventory cuts, which are commonly used (PwC, 2018; EY, 2018). Christopher has indicated that “strong positive cash flow has become as much a desired goal of management as profit” (Christopher, 2016, Templar, 2019, p. 104).

1.1.3.2 Connecting Working Capital Performance with Supply Chain and Procurement

There is a perceived general lack of understanding of the impacts of the supply chain on financial performance (Nuhiu and Dermaku, 2017). This is strengthened by the traditional organisational structure of businesses, which tends to measure supply chain and procurement functions’ performance with varied and sometimes opposing indicators (DeSmet, 2018). The determinant nature of supply chain and procurement organisations on accounts receivables, inventories and accounts payables’ performance, the main components of working capital, represents the operational link to the financial metric (DeSmet, 2018).

1.1.3.3 Scope of The Research

The scope of the research is working capital management best practices and the impact of requirements on the supply chain and procurement functions of businesses. The context used for the purpose of the research is manufacturing.

1.1.4 Chapter Structure

The chapter follows the Structure Literature Review (SLR) process and reviews 67 publications, including 62 journals, 2 practitioner reports and 3 books. At the end of this introduction chapter, section 1.2 details the methodology adopted during the SLR process. Section 1.3 outlines the descriptive findings of the literature review and presents the characteristics of the data collection templates used to gather evidence. Section 1.4 focuses on the thematic findings extracted from the data analysis. Section 1.5 discusses the material analysed and aims to synthesise and interpret the findings to answer each research question. Section 1.6, 1.7 and 1.8 reviews the main findings and limitations of the review and proposes future research next steps.

1.2 Methodology

1.2.1 Systematic Literature Review

A literature review is a “systematic, explicit and reproducible” (Fink, 2005, cited in Singh and Kumar, 2014) method of research allowing the review of existing research on a given topic. The systematic review of literature allows researchers to reach conclusions based on what is already known and studied (Saunders, Lewis and Thornhill, 2012). The systematic literature review (SLR) process is rooted in the field of medical science, where it was used to evaluate medical treatments (Tranfield, Denyer and Smart, 2003). It has since been transposed to the field of business and management (Denyer and Tranfield, 2009).

The literature review allows researchers to obtain an overview and “take stock” of existing work but also enables the development of new research (Booth, Sutton and Papaioannou, 2016). As defined by Kitchenham et al. (2009, p.8), the SLR is also “intended to support the development of evidence-based guidelines for practitioners”, which is one of the objectives of this chapter. This research follows the five key steps of the Systematic Literature Review, namely: Planning, Searching, Screening, Extraction and

Synthesis (Denyer and Tranfield, 2009). The main weaknesses around the SLR methodology are the relative newness of the application of this process (Grant and Booth, 2009).

1.2.2 Defining The Search Terms

The search terms were defined based on the chapter title “Working capital minded supply chain and procurement functions in manufacturing organisations”. Four key search terms were identified and are defined in Table 1.1:

Table 1.1 Definition of key search terms

Key Search term	Definition
Working Capital	There are three main definitions for working capital. The first one is gross working capital that only takes current assets into account. Current assets are generally made of the following main balance sheet items: cash and cash equivalents, accounts receivables, other receivables, down payments and inventories (Nuhiu and Dermaku, 2017). The second definition, which has gradually become the dominant one, is net working capital, which represents the excess of current assets over current liabilities (Nuhiu and Dermaku, 2017). Current liabilities’ main elements include accounts payable and short-term bank loans. A simplified and well accepted definition of working capital is the sum of AR and inventory less AP (DeSmet, 2018).
Supply Chain	As the time of vertically integrated businesses has come to an end, partly enabled by the growth of outsourcing allowing businesses to focus on their core business, today’s businesses tend to form an interdependently connected chain or supply chain. With the recognition of supply chains, which is the traditional arm’s length, adversarial relationships were challenged with the belief that greater benefits could be achieved through collaboration between suppliers and customers’ customers. As a result, supply chain management can be defined as a discipline seeking to optimise the upstream flow of goods and downstream flow of information and cash (Christopher, 2016; DeSmet, 2018). In the late 1990’s, Martin Christopher stated that “individual businesses no longer compete as solely autonomous entities, but rather with supply chains” (Christopher, 2016, cited in DeSmet, 2018).
Procurement	The CIPS’ (2016) definition of procurement is “the process undertaken by the organisational unit that, either as a function or as part of an integrated supply chain, is responsible for procuring or assisting users as well as the management of

	<p>suppliers, thereby contributing to the competitive advantage of the enterprise and the achievement of its corporate strategy.”</p> <p>As outsourcing increased, the proportion of external goods and service spend in relation to revenues increased to an average of 39.5%, and 45.3% in industrial manufacturing (Mena, Van Hoek and Christopher, 2018). The increased importance of external spend has established the strategic role of procurement, moving it away from its clerical debut at the beginning of the 1980s (Mena, Van Hoek and Christopher, 2018).</p>
Manufacturing	<p>Manufacturing refers to the process of producing goods (Jacobs et al., 2011). A typical manufacturing enterprise purchases raw material and manufactures finished goods for sale and distribution to customers (Jacobs et al., 2011). Consequently, the manufacturing cycle is characterised by raw material, work in process and finished goods inventories (Jacobs et al., 2011).</p>

This chapter aimed for a total number of 60 sources. A balance was sought around each circle in the Venn diagram (see Figure 1.1 below). Search strings were used for overlapping areas “A”, “B” and “C”. Search strings included the overlap of the “A”, “B” and “C” areas that represent the scope of the study. Searches also included the overlap of “A”, “B”, “C” in the manufacturing context. The more the search concentrated around the scope, the fewer the results found in the databases.

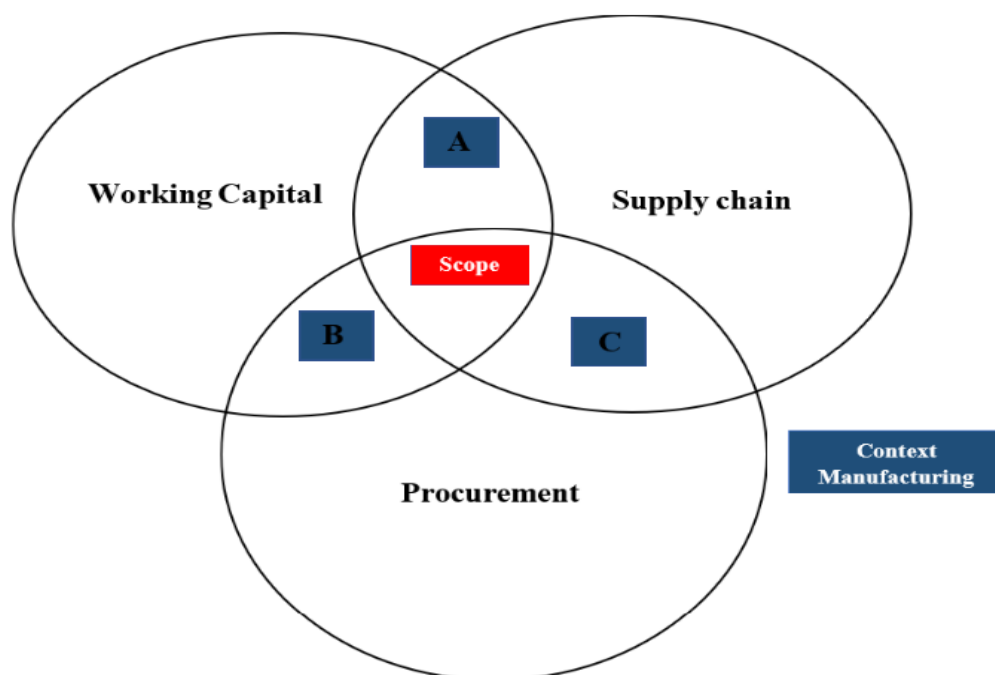


Figure 1.1 Venn diagram

1.2.3 Search Strings

Search strings were defined for each of the four key terms, namely working capital; supply chain; procurement and manufacturing. Synonyms or terms commonly related to the search terms were included to create the following main search strings (see Table 1.2).

Table 1.2 Search Strings

String 1	AND	String 2	AND	String 3	AND	String 4
Working Capital		Supply Chain		Procurement		Manufacturing
“Working capital*” OR “Liquidity*” OR “Cash Conversion Cycle*” OR “Cash to Cash Cycle*”		“Supply Chain*” OR “Demand Chain*” OR “Value Chain*”		“Procurement*” OR “Purchasing*” OR “Accounts Payable*”		“Manufacturing*” OR “Production*” OR “Industry*” OR “Non-financial*”

Boolean operators (e.g. AND, OR) imbedded in each database were used to allow the search strings to give the desired results. Several search string combinations were used in the search process, for example: String 1 & String 2, String 1 & String 3, String 1 & String 2 & String 3, etc. Additional searches were conducted, such as “working capital practices” or “working capital management”, to ensure that obvious sources of information were not missed.

1.2.4 Screening Process

A screening process was adopted to ensure the suitability of the identified sources for the research. A few search strings were generated with the databases and a total of 62 sources were identified. An additional 2 practitioner reports and 3 books were identified.

1.2.4.1 Academic Databases And Journals

The ProQuest database was selected for the subject areas relevant to this chapter that include business, management theory and techniques, business trends, accounting and finance. This database was also chosen for the types of sources accessible that encompass full-text journals as well as periodicals and reports. The advanced search of the database allows for full-text and peer reviewed filters to be applied and allows for Boolean searches (ProQuest, n.d.). A total of 79 sources were identified through ABI/INFORM, which was the primary search engine used for this SLR.

The EBSCOhost database was selected for its peer-reviewed content (EBSCOhost, n.d.) and Boolean and advance search engine options. Full-text journals and other sources are accessible online. EBSCOhost is used by thousands of institutions on a global basis. A total of 21 sources were identified through EBSCOhost.

The Scopus database was used for its peer-reviewed contents (Elsevier, n.d.), which include journals, books, and conference papers. The database's functionality allowed searches to be filtered on many characteristics; this database covers multiple fields including science, technology, medicine, social sciences, arts and humanities. The total number of records identified from the search of this database was 10.

Removing the duplicate sources, the total number of unique references is 62.

1.2.4.2 Academic Article Inclusion and Exclusion Criteria

Several inclusion and exclusion criteria were used to ensure that sources returned by the database complied with the set of pre-defined parameters see Table 1.3. The purpose of those criteria is the relevance and pertinence of the sources in relation to the research objectives of the chapter (Saunders, Lewis and Thornhill, 2012). The language, subject area, business sector, geographical area, publication period and literature type characteristics were derived from Bell (2010). In addition, this chapter includes access to full text format as one of the criteria for the research and analysis of the sources.

Table 1.3 Inclusion And Exclusion Criteria

No.	Characteristics	Inclusion Criteria	Exclusion Criteria	Justification
1	Article language	English	Any other language	Author only uses English. English is used internationally in the business and academic world. Many occurrences of sources originating from non-English speaking countries were provided in English
2	Geographical area	Worldwide	None	No limits were placed on the geographical scope of the selected sources as many were country specific
3	Publication period	2007- 2019	Pre-2007	To ensure the latest findings and research developments are included in the research
4	Literature type	Journal articles, trade journals, magazines, conference reports	All other	To ensure the reliability of sources, a preference was placed on peer- reviewed articles. Some non-peer reviewed sources were used
5	Subject area	Business, Management, Finance, Operations, Accounting	All other subject areas	To ensure the relevance of the research, the search only includes business, management, finance, operations, and accounting related sources
6	Business sector	Manufacturing or manufacturing related fields, non- financial	Non- manufacturing, financial	Manufacturing or at least product or production related sources had to be used
7	Availability	Full text available	Full text unavailable	Required to include the sources in the analysis

1.2.4.3 Incorporating Additional Sources

This chapter aimed to identify best practices around working capital management. Whilst best practices were not included as a search term due to the lack of specificity of the term, they still needed to be addressed. Running the searches for the terms defined in the Venn diagram (see Figure 1.1), several sources emerged around recurring themes, such as the relationship between working capital management and company profitability. Whilst those sources were read with the aim to extract and deduce best practices from them, few articles specifically came up with the term “working capital practices” within the title. In order to complement this gap, two additional sources from practitioners were

included in the total number of selected sources. Additional sources included books which were selected at the discretion of the review panel and the author (see Table 1.4).

Table 1.4 Summary Of Additional Sources

Title	Author	Year
All tied up in MENA	EY	2018
Navigating uncertainty: PwC's annual global Working Capital Study	PwC	2018
Supply Chain Strategy and Financial Metrics	DeSmet	2018
Supply Chain Management Accounting	Templar	2019
Working Capital Management	Sagner	2014

1.2.4.4 Quality Appraisal Process

A quality appraisal process assesses the quality of qualitative research for each of the 67 selected sources and are summarised in Table 1.5. Elements not applicable to a publication were excluded from the scoring average. Sources were accepted if the average of the applicable elements score attained an average of a minimum of 1.5 or above.

The first element “Contribution to the working capital management theory” was chosen to enable the fulfilment of the research around best practices for working capital management. The second element “Methodology” was selected to ensure that the results of the study conducted in the research were based upon a verifiable process. This is important as the research findings are determined by the methodology employed. The third element “Data analysis”, focused around the appropriateness of the data sample used, was also designated as it impacts the research findings used for this chapter. The fourth element “Implications for practice” was used to determine how well the research findings can be used to derive recommendations for implementation or practice. The fifth element “Level of citations” was selected to ensure that the research findings are rooted in verifiable literature sources. No exclusions were made following the scoring process as the lowest score recorded for each source was within the acceptance limit of 1.5.

Table 1.5 Sources quality appraisal framework

No	Element to consider	0	1	2	3	N/A
1	Contribution to working capital management theory		Theoretical absence	Partial theoretical base	Strong theoretical grounding; contribution to theory of practice	This element is not applicable for this publication
2	Methodology		The idea of study is poorly executed; inappropriate quantitative methods	Justified research design; the idea of study is not fully executed	Research design adequately examines the research argument	This element is not applicable for this publication
3	Data analysis		Data sample insufficient; inconclusive research results	Appropriate data sample; adequate results but inadequate explanation	Adequate data sample; well explained research results support theoretical arguments	This element is not applicable for this publication
4	Implications for practice		Study fails to inform practice of implications	Limited implications for practice provided	Critical implications for practice provided	This element is not applicable for this publication
5	Level of citations		Absence of citations	Some level of citation present	Comprehensive citations list	This element is not applicable for this publication

Area of rejection	This publication does not provide adequate information to assess this criterion
Area of acceptance	This publication provides adequate information to assess this criterion

(Adopted from Habib, 2012)

1.2.4.5 Data Extraction and Synthesis Process

Each publication was thoroughly read and key information recorded in a data extraction template, which was produced in Microsoft Word. Using templates allowed for information to be collected and recorded in a consistent manner. Both qualitative and

quantitative elements of the contents were included. Figure 1.2 shows the flow diagram followed for screening the dataset adopting SLR approach.

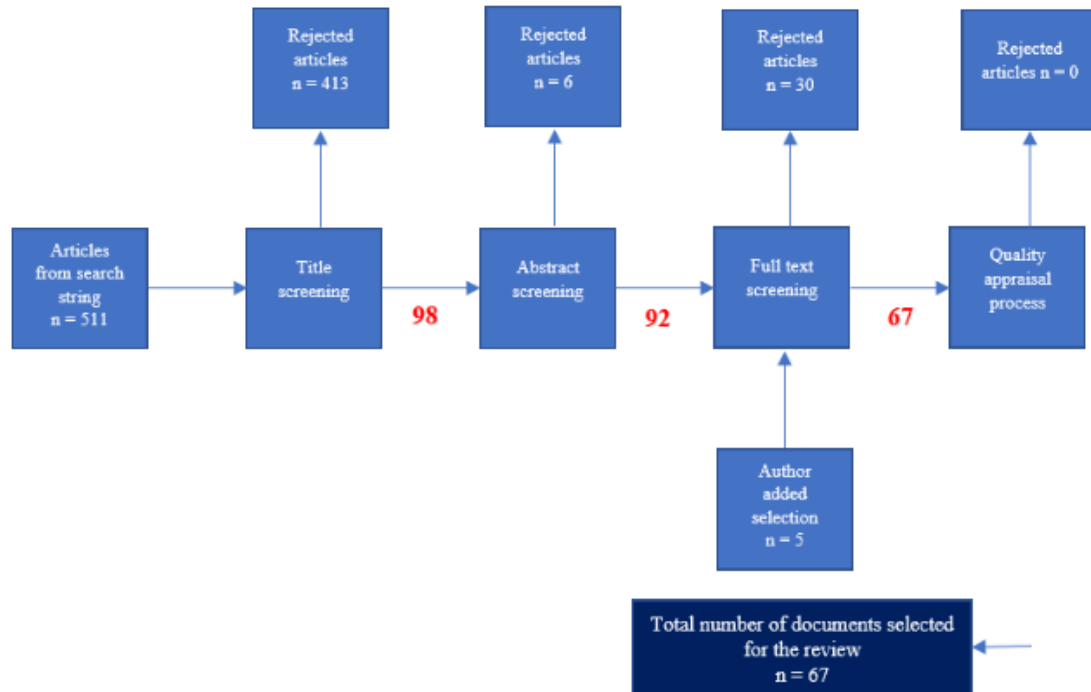


Figure 1.2 Sources selection process summary

1.3 Descriptive Findings

This section provides generic findings made based on chronology, geography, types, disciplines and recurrent themes that characterise the sources. In addition, an analysis of the findings extracted from the sources is provided. The term “sources” is used throughout the chapter to encompass the variety of the selected sources (i.e. journal articles, practitioner publications, books, etc.).

1.3.1 Chronological Distribution Of The Sources

The selected sources’ dates of publication spans around 2007 - 2019 as shown in Figure 1.3. It is noted that 37 of the 67 sources were published in the last 5 years; this represents 55% of all selected publications. As mentioned in Section 1.1, the higher number of sources appears in line with the noted greater interest in working capital since the 2007-2008 economic downturn. The recessionary context characterised by tighter credit conditions has provided research with a contextual prompt to expand the research

on working capital and provide more sources for analysis for this chapter. It is also worth noting that, at the time of writing this chapter, it was before mid- 2019 and that the search for sources beyond 2019 might have resulted in more than 3 sources.

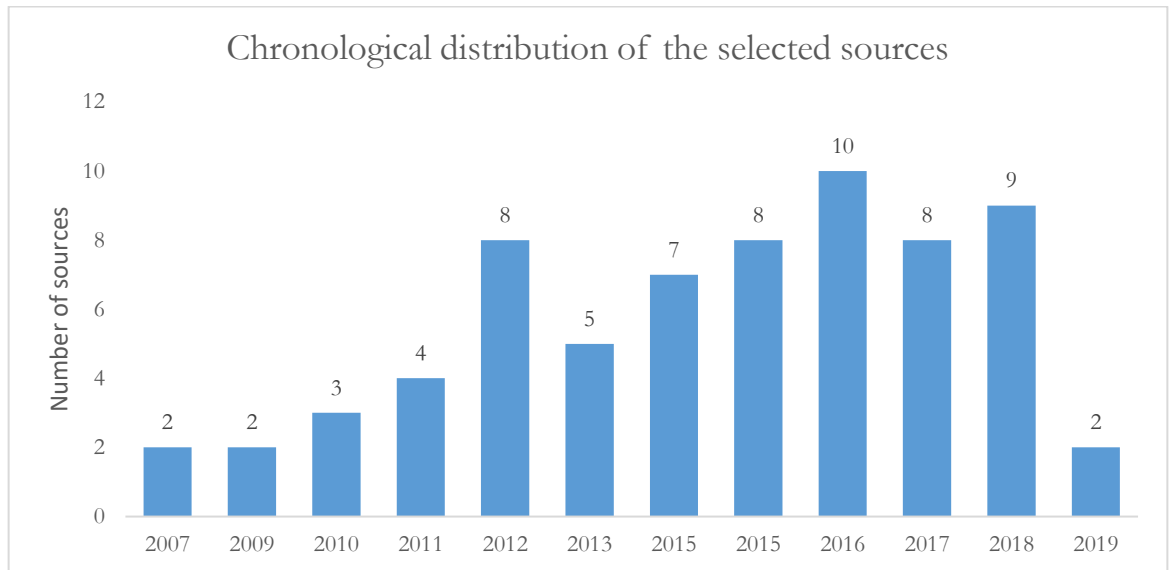


Figure 1.3 Chronological Distribution of the selected sources

1.3.2 Geographical Spread of The Sources

25, or 37%, of the selected sources either do not specify a geographical area or have applied a global approach to the studies conducted. The remaining 42, or 63%, of the sources do specify a geographical area of study. Close to 38% of those remaining studies are focused on Europe, 26% on Asia, 12% on Africa, and 10% on the Middle East, whilst others represent the last 10% and include North American, South American and global scope studies (See Figure 1.3). It can be concluded that the sources that do specify a geographical area of focus have a fair balance of western and non-western literature. This allowed the research to incorporate a balance of views on the topic from around the globe and to give more weight to the conclusions drawn in this chapter.

1.3.3 Types of Sources

Figure 1.4 shows that two-thirds, or 66%, of the documents selected are empirical studies using data samples from listed or private businesses. Conceptual studies represent 16% and are the second largest type of sources used and typically develop a mathematical model to derive conclusions using a set of fictive assumptions. The remaining 12 sources, also representing 18% of the total selected publications, are represented by surveys,

educational sources, literature reviews and practitioner reports. The latter are typically more conceptual and insightful for the purpose of answering the research objectives; however, represent the smaller proportion of the covered literature. This represents a challenge in the sense that some elements required for answering the research objectives, particularly the presence of insightful, relevant and named industrial examples, are lacking from most of the sources.

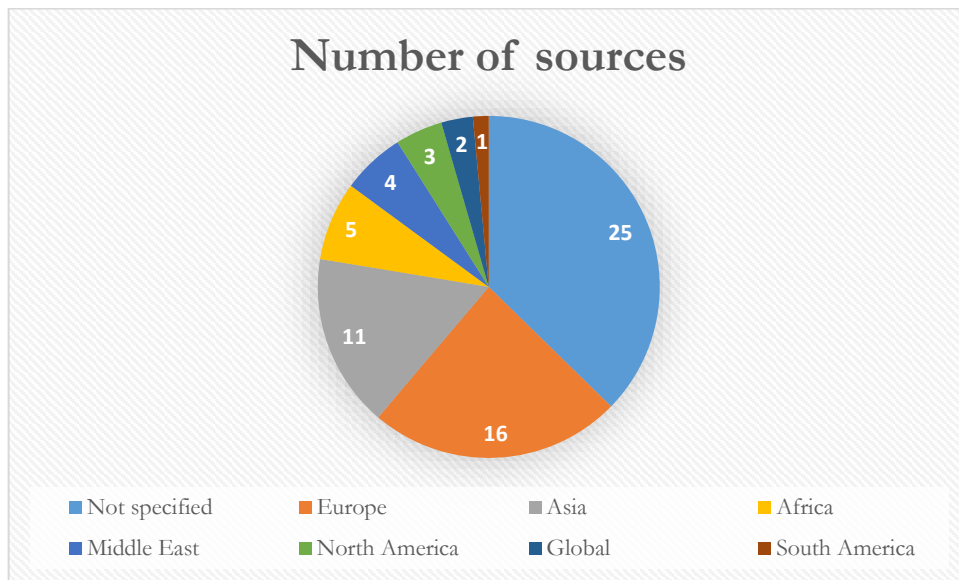


Figure 1.3 Geographical spread of the selected sources

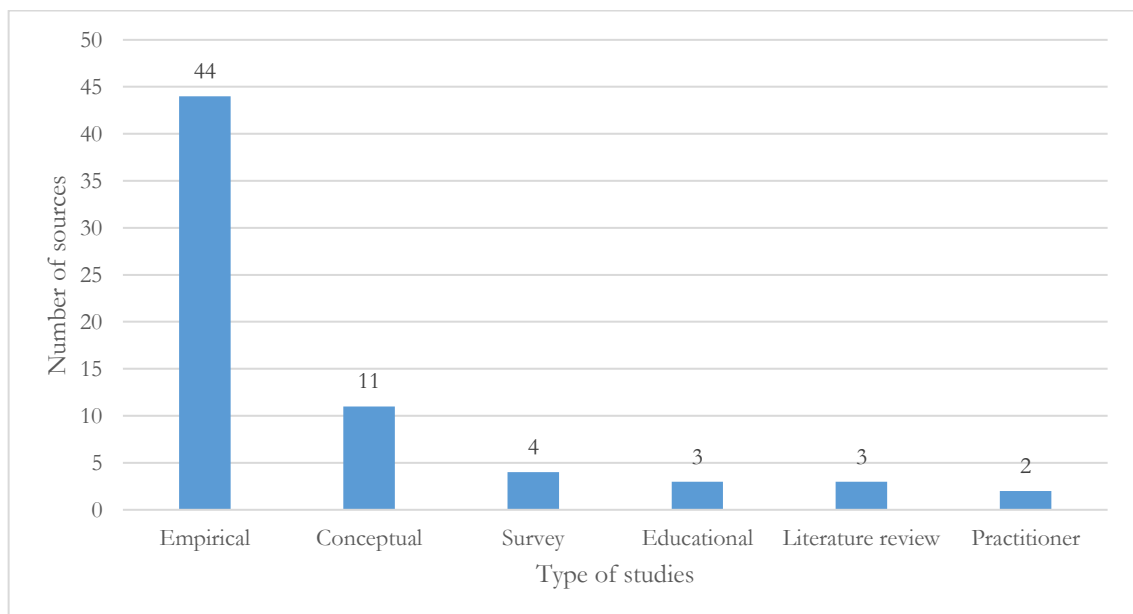


Figure 1.4 Types selected sources

Table 1-6 below displays a summary of journals by discipline for 62 academic journals and specialist articles used for the purpose of this chapter. It excludes books and practitioner reports, which represent 5 of the selected sources.

Table 1.6 Summary of Journals By Discipline

Journal Type	No. of Journals	Percentage
Finance	18	29%
Management / Business / Economics	16	26%
Purchasing / Supply Chain / Logistics	10	16%
Other	10	16%
Engineering	3	5%
Operations / Manufacturing / Engineering	3	5%
Business and Economics	2	3%
Total	62	100%

1.3.4 Overview of Disciplines

Figure 1.5 represents the selected sources by discipline. The disciplines are derived from the publication titles and journal titles and summarised in 5 key categories: Finance, Business & Management, Supply Chain & Logistics, Operations and Economics. It is important to note that 63% of the selected sources originate from finance and / or generalist business and management publications. Economics, which include macro-economics, includes a further 10% of the total sources. Supply Chain & Logistics and Operations oriented publications are represented by the minority, 26%, of the sources. Whilst procurement is addressed by the sources, no publication solely specialised on procurement appears in the selected documents.

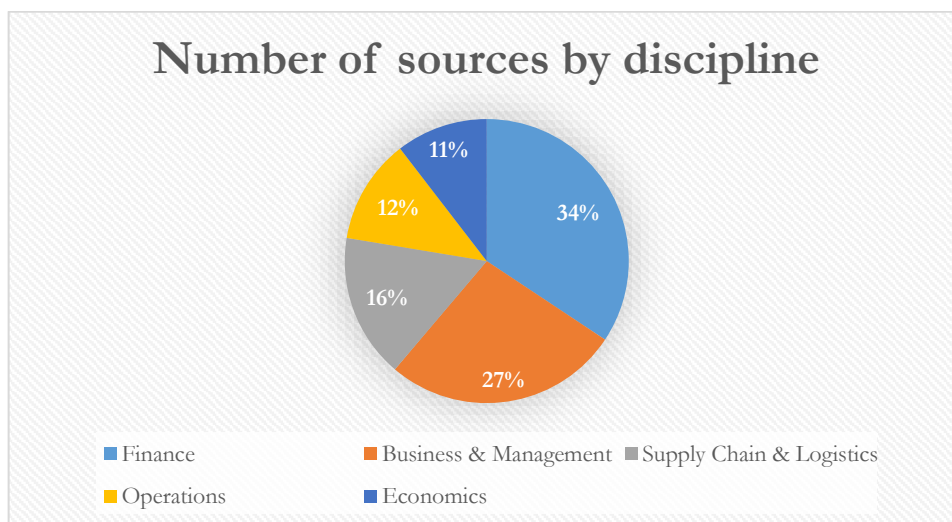


Figure 1.5 Sources by Discipline

1.3.5 Recurrent Themes

Recurrent themes addressed by the publications are derived from the article titles. 28, or 42%, of the sources have a focus on Working Capital Management. There is a fairly balanced spread of other themes between the selected documents. Note that the Working Capital Component category refers to the following elements of working capital: accounts receivable, inventory and accounts payable as shown in Figure 1.6.

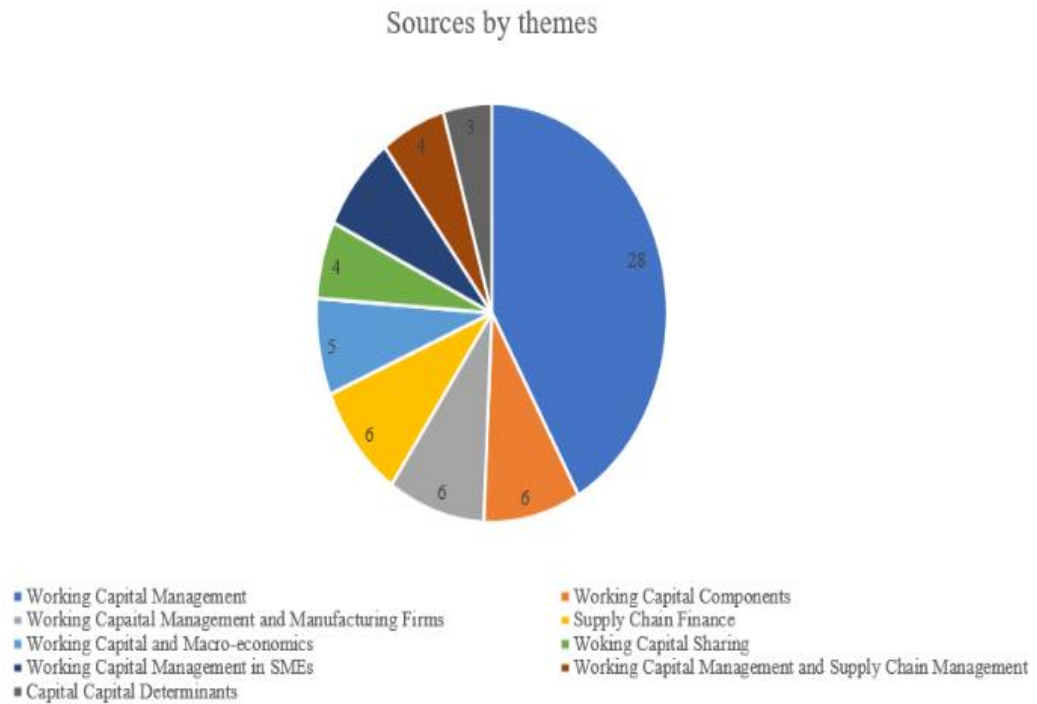


Figure 1.6 Sources by Discipline

1.4 Thematic Findings

1.4.1 Examining Working Capital

The term “Working Capital” was first appeared in the sources at the beginning of the 20th century (Nuhiu and Dermaku, 2017). The concept has existed under different names including what Karl Marx called variable capital. Adam Smith distinguished it from fixed capital whilst others called it current capital (Nuhiu and Dermaku, 2017).

Today, three main definitions for working capital emerge from the literature. The first one is gross working capital, which only takes current assets into account (Singh and Kumar, 2014). Current assets are generally made of the following main balance sheet items: cash, accounts receivables, other receivables, and inventory (Li and Wu, 2017;

Bendavid, Herer and Yucesan, 2017; Templar, 2019; Sagner, 2014). This definition would typically suit an analyst's view of working capital as current assets represent the funds required for operating the business (Nwude, 2017). The second definition is net working capital, which represents the excess of current assets over current liabilities (Singh and Kumar, 2014). Current liabilities' main elements include accounts payable, advance / prepaid expenses, accrued expenses, other payables, short-term loans, tax dividends payable, and overdrafts (Li and Wu, 2017; Bendavid, Herer and Yucesan, 2017; Templar, 2019; Sagner, 2014). A third and commonly accepted definition of working capital is operational working capital, which includes three components: accounts receivable and inventory on the asset side less accounts payable on the liability side (DeSmet, 2018). The term working capital is often used generically to designate net working capital or operational working capital (Zimon, 2017; Bendavid, Herer and Yucesan, 2017).

Table 1.7 Summary of Current Assets And Liabilities

Current Assets	Source	Current Liabilities	Source
Accounts Receivables	Li and Wu, 2017 ;Bendavid, Herer and Yucesan, 2017; Sagner, 2014; Templar, 2019	Accounts Payables	Li and Wu, 2017; Bendavid, Herer and Yucesan, 2017; Sagner, 2014; Templar, 2019
Inventory	Li and Wu, 2017; Bendavid, Herer and Yucesan, 2017; Sagner, 2014; Templar, 2019	Advance / Prepaid expenses	Li and Wu, 2017; Bendavid, Herer and Yucesan, 2017; Sagner, 2014
Other Receivables	Li and Wu, 2017	Accrued expenses	Li and Wu, 2017; Sagner, 2014
Cash	Bendavid, Herer and Yucesan, 2017; Templar, 2019	Other payables	Li and Wu, 2017
		Short term loans	Bendavid, Herer and Yucesan, 2017
		Tax	Templar, 2019
		Dividends payables	Templar, 2019
		Overdraft	Templar, 2019
		Short term loans	Bendavid, Herer and Yucesan, 2017

1.4.2 Accounting Fundamentals

Understanding working capital requires accounting knowledge and the ability to dissect the structure of a balance sheet (DeSmet, 2018; Templar, 2019). The balance sheet is a two-side snapshot, a positional financial statement of what a company owns and owes at a point in time. What the business owns comes under the asset side of the statement whilst what the business owes comes under the liability side (Templar, 2019). Generally,

the balance sheet lists items in order of liquidity, which refers to the speed of an item's convertibility into cash (Templar, 2019). Following this principle, both assets and liabilities are categorised as short-term or current and long-term or non-current (DeSmet, 2018; Templar, 2019). Short-term usually refers to assets' convertible into cash within one year and liabilities due within one year.

Working capital is not displayed as a dedicated item on the balance sheet. It is a financial result that reflects how well a business finances its operations, or current assets, with its current liabilities (DeSmet, 2018). Low working capital results indicate that long-terms or fixed assets are financed by short-term liabilities (Sagner, 2014). On the other hand, a positive working capital means that short-term assets are funded on a long-term basis (Nuhui and Dermaku, 2017).

1.4.3 Concept Surrounding Working Capital

The liquidity concept refers to cash held by a business and kept fulfilling its short-term obligations as they fall due (Sagner, 2014). Metaphors for liquidity are often used in the literature as cash and working capital and referred to as "oil in a car" (Templar, 2019) and "the lifeblood of a business" (Chatnani, 2018). Other benefits of holding cash include the reduction of financial risk, lowering the cost of raising external funds and freeing capital for investments (Enow and Kamala, 2016a). The literature mentions precautionary and speculative motives for holding cash in a business (Enow and Kamala, 2016a; Gill and Biger, 2012). In addition, the pecking order theory of Myers (1984, cited in Gill and Biger, 2012) is regularly mentioned in the selected sources. This theory states that the businesses fund themselves following a generally accepted order of preference. Firstly, businesses tend to prioritise internal funding from retained earnings or cash available (Gill and Biger, 2012; Tahir and Anuar, 2016). Secondly, debt is preferred to equity (Tahir and Anuar, 2016).

It is important to differentiate working capital and profitability as a business may be profitable but collapse due to its inability to meet its debts (Sagner, 2014). However, many studies have been conducted to determine the correlation between working capital performance and profitability (Puraghajan, Ramzani and Bin, 2012; Chatnani, 2018; Yazdanfar and Ohman, 2014; Ali, 2011). A study conducted by Abuzayed (2012) indicated that profitable businesses are less incentivised to manage their working capital. A study by Puraghajan, Ramzani and Bin (2012) found that working capital being managed by

speeding the settlement of commercial transactions and reducing inventory is associated with higher corporate profitability. An earlier study conducted by Padachi (2006) revealed that high levels of inventories and receivables were associated with lower profitability performance. On the other hand, it has also been recognised that larger working capital inventory can avoid disruptions in the manufacturing flow, therefore supporting sales and profitability (Banos-Caballero, Garcia- Teruel and Martinez-Solano, 2010). Indeed, prioritising profitability by increasing sales tends to negatively impact liquidity and excessive focus on working capital may hinder profitability (Beaumont-Smith and Fletcher, 2009).

1.4.4 Determinants of Working Capital

The main working capital components of accounts receivable, inventory and account payable are important determinants of its value or size (DeSmet, 2018; Golas, Czerwinska-Kayzer and Bieniasz, 2011). Other determinants may include sales growth, size of the business or the industry in which the business operates (Banos-Caballero, Garcia-Teruel and Martinez-Solano, 2010). Indeed, it can be inferred that an increase in sales is likely to increase inventory and receivables' requirements. The size of the business, typically measured by sales revenue, also has an impact on the size of working capital requirements. However, working capital as a proportion of a business' revenue may vary depending on its size. The case of SMEs pressured to grant a longer payment settlement period by their larger, more powerful customers is often quoted in the literature (Protopappa-Sieke and Seifert, 2017). In the United Kingdom, the government requires businesses meeting specific criteria in turnover, balance sheet size and number of employees, to report on their payment practices and to pay 95% of their supplier invoices within 60 days from the date of receipt of the invoice (Great Britain. Department for Business, Energy & Industrial Strategy, 2017). Regulation is being implemented to tackle poor payment practices. Indeed, the Federation of Small Businesses (FSB) in the United Kingdom has also reported that more than 50,000 businesses go bankrupt each year due to delayed payment practices (Bounds and Moules, 2019). The country's 5.7 million SMEs are owed a total of £13 billion (Bounds and Moules, 2019).

The type of industry also impacts working capital. For example, retailers are characterised by low receivables outstanding as they get paid at or shortly after the time of purchase. A PwC Working Capital survey of the retail industry published in 2014 shows that the retail sector has a median 8 Days of Sales Outstanding, 33 Days of Inventory

Outstanding and 28 Days of Payables Outstanding. This means an overall 13 days of working capital, which shows that 13 days of working capital must be funded on a long-term basis. By contrast, the manufacturing sector, reports a median Cash Conversion Cycle of 71 days (Davies and Merin, 2014), which is the second highest of the industry types. Note that the cash conversion cycle is equivalent to days of working capital and that the 71 days of working capital reported by Davies and Merin (2014) are directly comparable to the 13 days of working capital reported for the retail sector (PwC, 2014).

1.4.5 Relevance of Working Capital

1.4.5.1 Impact of Working Capital on Overall Financial Performance

Current assets and non-current assets make up the total assets of a business. Current liabilities are subtracted from the total assets to return the capital employed (CE) of a business. Capital employed is the denominator used to calculate the Return on Capital Employed (ROCE) profitability ratio. The ROCE is an important profitability ratio, used by investors to reveal how profit is generated by the management team of a business (Templar, 2019).

1.4.5.2 Connecting Supply Chain, Procurement and Working Capital

ROCE is the most important financial ratio for supply chain practitioners. DeSmet (2018) and Templar (2019) have discussed that the working capital components to demonstrate the connection between supply chain, procurement with working capital and overall financial performance.

1.4.5.3 The Economic Downturn of 2007-2008

The financial downturn of 2007-2008 led to reduced bottom lines and difficult access to credit (Baker et al., 2017), which prompted businesses to look at cash more seriously (Gelsomino et al., 2016; Singh and Kumar, 2014; Haron and Nomran, 2016). Indicatively, it has been recognised that the publication activities on the topic of working capital increased since the slow-down (Singh and Kumar, 2014; Haron and Nomran, 2016). Aluminium producer Alcoa, with revenues of \$13.4 billion reported in 2019 (Alcoa, 2019), initiated a working capital improvement programme in 2009 in response to the financial crisis (Davies and Merin, 2014). The recession was also associated with the behaviour of extending payable accounts with suppliers (Lorrenz et al., 2016). The businesses upon which the extension requests were placed would consequently have to increase their

accounts receivables with the view of maintaining sales revenues (Lorrenz et al., 2016). As indicated in an automotive industry study, such a situation has resulted in an increased risk of bankruptcy for suppliers forcing the industry to fund working capital and to incur costs of capital (Protopappa-Sieke and Seifert, 2017).

1.4.6 Working Capital Management Strategies

Three working capital management strategies emerge from the sources:

- 1) aggressive
- 2) conservative
- 3) moderate

1.4.6.1 Aggressive Working Capital Management

The aggressive approach to working capital management consists in holding low levels of current assets whilst increasing current liabilities (Zimon, 2015). This strategy is considered to pose higher risks as it seeks to minimise inventory, which may result in lost sales (Zimon, 2017; Puraghajan, Ramzani and Bin, 2012). As mentioned in the trade-off section, it can be further deduced that an aggressive management of accounts receivables may also result in antagonising customers and lost sales (Puraghajan, Ramzani and Bin, 2012). Although riskier, aggressive working capital management reduces the level of corporate investment in working capital and can lead to increases in productivity (Boisjoly and Izzo, 2009). For example, several working capital initiatives undertaken at Rio Tinto (2019) have resulted in low working capital. The major Anglo-Australian aluminium producer with revenues of \$40.5 billion in 2018 covers almost the totality of its receivables and inventory assets with its payables owed to suppliers (see Table 1.8). Rio Tinto has practically achieved zero working capital according to the figures below (Rio Tinto, 2019).

Table 1.8 Rio Tinto Working Capital Components In 2018

Working Capital Component in \$m	Rio Tinto
Receivables (+)	3,447
Inventories (+)	3,179
Payables (-)	6,600
Net Working Capital	26

(Source: Rio Tinto, 2019)

1.4.6.2 Conservative Working Capital Management

A conservative approach to working capital management typically involves high assets and low liabilities (Zimon, 2017). The rationale behind this strategy is to ensure availability of accounts receivables and inventories to ensure smooth operations (Afrifa, 2016). This strategy is generally considered to come with lower risks in terms of profitability as there is a strong investment in current assets whilst focusing on extending payables terms to finance the current assets (Tahir and Anuar, 2016).

1.4.6.3 Moderate Working Capital Management

The moderate approach to working capital management aims to exploit the advantages of the aggressive and conservative working capital strategies (Zimon, 2017). This balancing act suggests that the use of trade-offs must be used to appropriately determine working capital requirements. For example, a differentiated approach may be applied where the level of aggressiveness of the strategy is tailored to the maturity of the asset or liability being handled (Baker et al., 2017). For example, aggressive collections may be prioritised for customers based on sales volumes, inventory holding may be determined based on consumption and payment term extensions may be applied based on supplier spend. To exemplify the conservative and / or moderate strategies, another major aluminium producer has been used, Norwegian Norsk Hydro ASA with revenues of \$18.3 billion in 2018 (Hydro, 2019). The position of the company differs from that of Rio Tinto as summarised in Table 1.9.

The smaller business requires less working capital than its bigger competitor on the asset side, strictly considering gross working capital. However, the performance of each business in the payables area differs widely. In the case of Hydro, working capital represents nearly 17% of its annual revenues, compared to 0% for Rio Tinto (2019). This is due to the fact that payables do not cover the asset components of working capital, receivables and inventory.

Table 1.9 Hydro Working Capital Components in 2018

Working Capital Component in \$m	Hydro
Receivables (+)	2,379
Inventories (+)	3,037
Payables (-)	2,337
Net Working Capital	3,079

(Source: Hydro, 2019)

1.4.7 Aligning The Management Of Supply Chain, Procurement And Working Capital

The purpose of this section is to summarise elements of alignment between supply chain and procurement management theories and principles with those of working capital management, using supply chain principles for working capital management.

Key supply chain trends and principles include the full integration of material, logistics, information and capital flows (Li and Wu, 2017). Working capital management is about converting receivables and inventory into cash as speedily as is reasonably possible (Li and Wu, 2017). The converging objectives of flow efficiency in working capital and supply chain management create alignment between the two disciplines (Jiang, Zhong and Hu, 2010). The sources suggest that the supply chain theories and principles should be used to drive working capital management and vice-versa (Jiang, Zhong and Hu, 2010; Peng and Zhou, 2019). Key supply chain principles relevant to working capital management are summarised by Jiang, Zhong and Hu (2010) in Table 1.10.

1.4.7.1 Using Procurement Principles for Working Capital Management

Since the rise of procurement as a strategic function in charge of controlling spend and of managing suppliers, the impact of procurement can be connected to the purchase of inventories and their corresponding accounts payable transactions (Nikolaos, Socrates and Lambros, 2018). Procurement has a strong focus on cost reduction; a leading function seen as a driver of competitive advantage (Mena, Van Hoek and Christopher, 2018). In a cross-industry comparison presented in Mena, Van Hoek and Christopher (2018), the manufacturing sector proportion of spend, as a percentage of sales reported, was 45.3%. This figure is the highest amongst the other industries reported on and a large proportion of this spend is attributed to the purchase or raw material inventories (Mena, Van Hoek, Christopher, 2018).

Table 1.10 Supply Chain Principles Relevant to Working Capital

Supply Chain Principle	Working Capital Impact
Strengthen partnerships' management of supply chain and form strategic alliances	Focus on supplier relationships for accounts payable and inventory management purposes

Focus on suppliers' selection and management, and decrease costs of procurement	Focus on cost may increase the working capital conversion cycle
Improve inventory management, reduce capital occupation	Inventory management techniques to ensure effective asset turnover
Focus on customers' relationship management, and meet customers' needs	Focus on customer relationships for the purpose of improving accounts receivable

(Source: Adapted from Jiang, Zhong and Hu, 2010)

1.4.7.2 Working Capital Beyond the Focal Firm

Some sources have introduced the concept of optimising working capital beyond the focal firm (Hofmann and Kotzab, 2010), applying the process of supply chain integration to working capital. This concept attempts to offer a solution to working capital practices leading businesses to push payment term extensions on to their suppliers (Hofmann and Kotzab, 2010) by providing a pool of working capital (Protopappa-Sieke and Seifert, 2017) within a selected group of the organisation. This approach aims to extend the cash-to-cash cycle of the companies with the lowest cost of capital and to reduce the cash-to-cash cycle of the companies subject to higher costs of capital. The strategy is to reduce current assets from receivables and inventories and increase current liabilities by stretching payables (Hofmann and Kotzab, 2010).

1.4.8 Working Capital Activities

This section of the chapter is concerned with providing a summary of working capital activities that are relevant to supply chain and procurement functions within manufacturing businesses.

1.4.8.1 The Initiating Finance Function

Working capital management often starts with a programme that is initiated by the CFO (Sagner, 2014) and which has high visibility to senior management (DeSmet, 2018). Working capital programmes enable businesses to set management practices and processes as, often, there is no “working capital manager” (Sagner, 2014). Whilst working capital management is often prompted by the finance function, improving working capital involves improving day-to-day operational processes. However, the finance function is responsible for financial planning, including cash planning, which estimates shortages and surpluses throughout the year (Enow and Kamala, 2016a).

1.4.8.2 Accounts Receivables Practice

Accounts receivable management is concerned with speeding up the time taken for customers to settle their payments. To achieve effective process management (Batram, 2013), the invoices raised on suppliers must be accurate and measures need to be implemented to monitor performance (Batram, 2013). The customer credit conditions should be reviewed (Li and Wu, 2017) to ensure that they are appropriately tailored (PwC, 2018). Other best practices for accounts receivable include proactive collection management, aligned and optimised customer terms, billing timeliness and quality, contract and milestone management, systematic dispute resolution and dispute root cause elimination (PwC, 2018). Receivables are directly impacted by poor payables practices and a buyer's payables are the seller's receivables.

1.4.8.3 Inventory Practices

The purpose of inventory is to satisfy customer demand (Baker et al., 2017). Inventory management is concerned with the control of inventory in order to plan for desired levels (Alrjoub and Ahmad, 2017) that will satisfy the demand and avoid the build-up of excess. It is important to manage stock actively, to perform regular stock checks and to act upon discrepancies (Batram, 2013). Generally, good inventory management involves real time information correctly entered in the management systems (Li and Wu, 2017). Inventory management should be standardised across business units (Li and Wu, 2017) and storage and use of inventory should be clear and orderly (Li and Wu, 2017).

The manufacturing process should be looked at carefully and waste eliminated (Abbas et al., 2018). For example, lean systems related to eliminating waste would involve decreased set-up times, small lot sizes and pull-production (Abbas et al., 2018). Make-to-stock and make-to-order rules (Batram, 2013) should be defined and inventory management strategies should be tailored to the consumption pattern of the inventory (Christopher, 2016). For example, a volume-variability matrix may be implemented for the management of inventories (Christopher, 2016). An unnamed example of this technique being applied in manufacturing is reported by Davies and Merin (2014). A management team decided to determine their inventory levels by considering usage variability in the process (Davies and Merin, 2014). Inventory management techniques to employ include the implementation of inventory parameters and controls (Davies and Merin, 2014). Collaboration with supply chain partners for inventory management is possible through Vendor Managed Inventory (VMI), employing postponement

approaches and having the right supporting technology for the supply chain (Alrjoub and Ahmad, 2017).

1.4.8.4 Account Payable Practices

Suppliers are at risk of being perceived as a cheap source of cash for their customers (Hofmann and Kotzab, 2010). However, it is important to ensure sustainability of the supply chain and to take the supplier's financial health into account when managing payment terms (Li and Wu, 2017). Publicly available data show that only 35% of the 7,512 government supplying companies that are required to report on their payment practices are paying 95% of their invoices to their suppliers within 60 days. This means that 65% of those 7,512 companies are not yet compliant with the government regulation (Great Britain. Department for Business, Energy & Industrial Strategy, 2019). Data results are summarised in Table 1.11.

Best practices around accounts payable management include paying suppliers on time (Batram, 2013) in line with the procurement goal of maintaining good relationships (Bauer, 2007). Negotiated discounts with suppliers (Batram, 2013) should be done sensibly ensuring that the trade-off of impact to inventory is considered (Batram, 2013). E-procurement solutions can be used to extend payment terms, not only for cost reduction purposes (Batram, 2013). Purchasing spend should be consolidated and controlled by a centralised procurement function to avoid unauthorised purchases, which may also impact inventory (PwC, 2018). Consolidating spend involves supplier rationalisation that enables the increase of spend to fewer suppliers and the negotiation of better payment terms (Bauer, 2007). Payment frequencies should be managed closely to eradicate early payment (PwC, 2018) by ensuring that payments are made on the last day that a payment is due (Enow and Kamala, 2016b).

Table 1.11 Summary of government supplier invoices paid later than 60 days

% of invoices paid later than 60 days	Number of companies	Percentage of companies
Less than or equal to 5% (compliant)	2,664	35%
More than 5% and less than or equal to 50% (non-compliant)	3,799	51%
More than 50% (non-compliant)	374	5%
Figure not available (non-compliant)	675	9%
Total	7,512	100%

1.4.9 Supply Chain Finance

The Global Supply Chain Finance Forum defines supply chain finance (SCF) as the “use of financing and risk mitigation practices and techniques to optimise the management of the working capital and liquidity invested in supply chain processes and transactions” (Templar, 2019, p.127). The buyer-led approach to supply chain finance appears to be the dominant one. In this model, the buyer oversees creating the relationship with the third-party lender, usually a bank, or more recently fintechs (Fernandes and Ellram, 2017). Tradeshift is an example of a fintech solution that digitalises the processes across procure-to-pay processes, incorporating supply chain finance and dynamic discounting in a tool that connects buyers and suppliers (Tradeshift, n.d.).

Supply chain finance, as a concept, initially appeared in the literature in the early 2000s (Iacono, Reindorp and Dellaert, 2015). In the broad sense of the term, supply chain finance encompasses several solutions (Sagner, 2014). Receivables and payables trade credits are, in essence, a form of supply chain finance (Protopappa-Sieke and Seifert, 2017). The term supply chain finance is, however, often used generically to designate its most popular solution, reverse factoring (Lekkakos and Serrano, 2016). Reserve factoring is a well-defined arrangement (Iacono, Reindorp and Dellaert, 2015). A buyer is in charge of contacting the selected financial institution and informing it of its payment obligations to selected suppliers. This enables suppliers to borrow against the value of the relevant accounts receivable in exchange for a cheap rate. The impact of this solution is the reduction of costs associated with trade-credit and by extension, working capital. The benefits of supply chain finance have been highlighted for the smaller, SME type, businesses in supply chains (Iacono, Reindorp and Dellaert, 2015). In the latest PwC Working Capital Survey (2018), businesses surveyed considered that working capital optimisation was the key reason for implementing supply chain finance (see Figure 1.7). Reverse factoring (RF) has been initiated by large firms with high-quality credit rating as a mechanism for soothing their suppliers’ financing problems (Lekkakos and Serrano, 2016).

Principal reasons for implementing an SCF programme

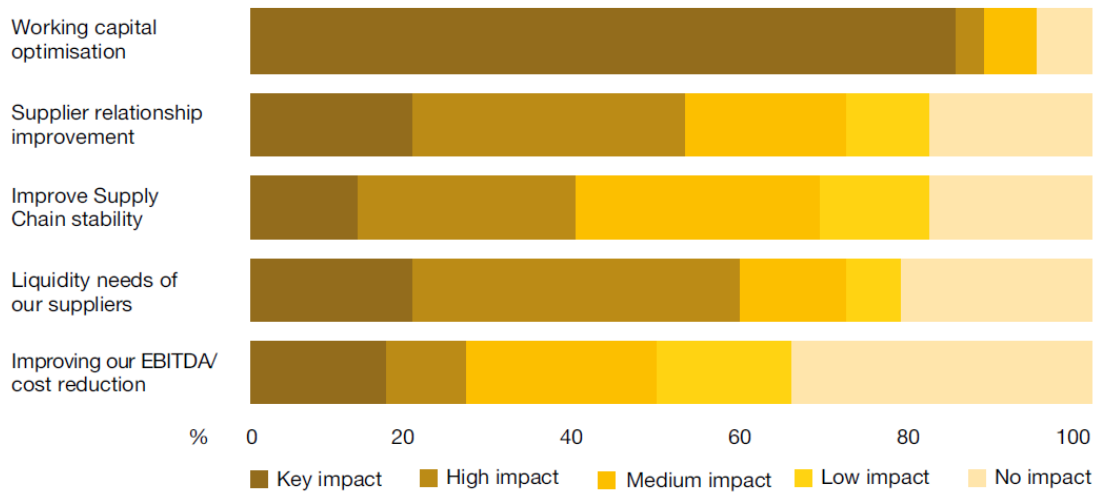


Figure 1.7 Principle Reasons for Implementing A Supply Chain Finance Programme
(Source: Adapted from PwC, 2018)

Supply chain finance features in the United Kingdom’s payment practices’ reporting guidelines and the publicly available data are published online (Great Britain. Department for Business, Energy & Industrial Strategy, 2017). Examples of manufacturing businesses offering supply chain finance include Aconic Manufacturing, Heineken, Mars, Karlsberg and GlaxoSmithKline (Great Britain. Department for Business, Energy & Industrial Strategy, 2019).

1.5 Discussion

1.5.1 Working Capital Trends

Macro-economic trends have had an impact on the interest received by the topic of working capital. Indeed, the global economic downturn of 2007-2008 is mentioned in no less than 11 of the selected sources. Impact of the crisis involved tightening credit conditions as well as reduced top lines for businesses around the globe. The recessionary factors forced businesses to look at how to improve their cash flow and find ways to do more with less. One of the ways to improve cash, and in which the participation of supply chain and procurement functions is crucial, is by reducing working capital.

The approach of working capital management has changed over time. As previously mentioned, working capital used to be viewed as a positive element of a balance sheet, a view pushed by the interest-driven banking sector (Sagner, 2014). This approach to

working capital management resonates with the conservative, low risk approach of working capital (Zimon, 2017), which consists of holding high levels of current assets and low levels of current liabilities. The opposite conservative approach consists of holding low levels of current assets and high levels of liabilities (Tahir and Anuar, 2016). This approach is generally considered riskier (Afrifa, 2016) as it would typically correspond to practices such as aggressive collection methods from customers and reliance on suppliers for extended payment terms, which could alienate partners in the supply chain (Protopappa-Sieke and Seifert, 2017). For all its downsides, the aggressive approach is one that reduces working capital whilst the conservative approach would more likely increase it. The sources recognise the negative impact of each working capital strategy and recent management trends have given way to what would correspond to a moderate approach (Baker et al., 2017). This approach appears to make sense as its objective is to manage working capital in a sensible manner that makes the supply chain sustainable as a whole. This new understanding coupled with technology enabled the development of collaborative supply chain finance solutions. New concepts of working capital sharing beyond the focal firm are emerging in the literature in an attempt to apply supply chain theory to working capital management (Hofmann and Kotzab, 2010; Peng and Zhou, 2019).

1.5.2 Implications of Working Capital Management on Supply Chain and Procurement

This chapter has clearly demonstrated the influence of supply chain and procurement on overall firm financial performance. The chosen financial performance ratio used to demonstrate this impact is ROCE, which has been recognised as the most important financial ratio for supply chain and procurement practitioners (Sagner, 2014; Templar, 2019). Working capital components impacted by supply chain and procurement were clearly identified as receivables and inventories on the asset side and payables on the liability side (see Figure 1.10).

What working capital implies for supply chain and procurement functions is that they have to take an approach that goes beyond cost and also take working capital considerations into account. As mentioned by Christopher (2016, pp. 71- 72), “in today’s financially challenging business environment improving the shape of the balance sheet through better use of assets and resources has become a priority.” Working capital initiatives, due to their financial nature, are often initiated by a Chief Finance Officer

(CFO) in reaction to an event (Sagner, 2014). However, this chapter demonstrates that working capital improvement requires a cross-functional effort that goes beyond the finance function to involve operations, manufacturing, procurement, supply chain, and marketing (Davies and Merin, 2014). Indeed, many of the practices extracted from the sources and detailed in the following Working Capital Maturity Matrix / Framework fall within the scope of the functions.

1.5.3 Working Capital Maturity Matrix

One of the objectives of this chapter was to extract the common malpractice or gaps and best practices of working capital management. Three elements of maturity were widely identified in the literature review:

- Working Capital Awareness
- Working Capital, Supply chain and procurement Alignment
- Scope of Activities

Practices were associated with a “lagging” organisation when their impact on working capital was considered negative by the source. On the other hand, practices were associated with a “leading” organisation when their impact on working capital was considered positive. Here, the term negative and positive are used qualitatively to describe “malpractice” and “best practice”, respectively. This distinction is important as quantitative negative impact on working capital would improve performance.

1.5.3.1 Working Capital Awareness

The literature documents a general lack of focus surrounding working capital. Sagner (2014) mentions the “missing working capital manager”. Working capital management is often perceived as a finance responsibility (Sagner, 2014). However, the operational influence of supply chain and procurement activities on working capital performance was demonstrated by the sources and detailed in the previous sections (see Figure 1.8). In addition, Davies and Merin (2014) have reported a lack of awareness around working capital management, which is partly caused by the fact that it does not impact earning or operating profit, which is what most of employees are compensated for and, therefore, incentivised by. Thus, “Working Capital Awareness” in organisations appears to indicate more maturity

1.5.3.2 Working Capital, Supply Chain and Procurement Alignment

Alignment of supply chain and procurement with working capital management was established as the second element to consider for assessing a company’s maturity. The trade-offs are summarised in Table 1.12.

Table 1.12 Working Capital, Supply Chain And Procurement Alignment Maturity Table

Lagging organisation	Leading organisation
The trade-offs relevant to the business are not known within supply chain and procurement functions (Ani, Okwo and Ugwunta, 2012; Bendavid et al., 2017; Tahir and Anuar, 2016)	Trade-offs are defined (e.g. profitability & liquidity; bulk inventory purchases & cost of capital) and taken into account when making supply chain and procurement decisions (Ani, Okwo and Ugwunta, 2012; Bendavid, Herer and Yucesan, 2017; Tahir and Anuar, 2016)
Supply chain and procurement and working capital strategies are unaligned (Hofmann and Kotzab, 2010)	Supply chain and procurement and working capital strategies are defined in coordination to ensure alignment of objectives (Hofmann and Kotzab, 2010; Davies and Merin, 2014)

1.5.3.3 Scope of Activities

The operational working capital management activities that fall within the scope of supply chain and procurement were defined in Figure 1.10, and include the management of AR, inventory and AP. Other working capital management activities include organising for working capital management. Table 1.13 below summarises the third maturity assessment element: “Working capital and supply chain and procurement scope of activities”.

Table 1.13 Scope of Activities

Lagging organisation	Leading organisation
Roles and responsibilities around working capital management are not well defined, some management elements are treated in isolation (Davies and Merin, 2014)	The business is organised for working capital management with committee, focus group, task force on key elements (e.g. cross-functional inventory management) (Davies and Merin, 2014)
Working capital is triggered by a program initiated by finance on a punctual basis (Sagner, 2014)	Working capital is part of the business practices and culture which extends beyond the finance function to include supply chain, procurement, sales, manufacturing, and IT (Davies and Merin, 2014)

Customer credit conditions are rarely reviewed (Li and Wu, 2017; PwC 2018)	Customer credit conditions should be reviewed regularly (Li and Wu, 2017; PwC, 2018)
Inventory management practices are not standardised in the business entities or locations, leading to different practices (Li and Wu, 2017)	Standardised inventory management process that enables business level visibility of inventory management processes (Li and Wu, 2017)
Inventory management practices are ill-placed, stock checks are inaccurate, and processes are broken (Batram, 2013)	Inventory management practices are in place, make-to-order and make-to-stock strategies are defined (Batram, 2013). Inventories are differentiated by a volume / variability matrix (Christopher, 2016; Davies and Merin, 2014)
Little to no collaboration with the wider supply chain partners (Peng and Zhou, 2019)	Collaboration with suppliers has been implemented. SCF finance, reverse factoring, VMI programmes and postponement approaches are in place (Peng and Zhou, 2019)
Suppliers are perceived as a cheap source of cash (Bounds and Moules, 2019)	Supplier payment term extensions are requested sensibly safeguarding the sustainability of the supplier's delivery to ensure no disruptions in the supply chain (Batram, 2013; Great Britain. Department for Business, Energy & Industrial Strategy, 2017)

1.6 Conclusion

1.6.1 Review of Objectives

The authors consider that all objectives set out in this chapter have been achieved. Table 1.14 below links the research objectives with section references that support the answers to the research questions:

Objective 1: The literature was analysed to identify the trends that impact working capital. The economic downturn of 2007-2008 appears to have had a major contextual influence on working capital management. Difficult access to credit in this recessionary context made cash more relevant to businesses and business academia (see Section 1.4.5). Trends in management strategies point towards a moderate approach to working capital, which recognises the benefits of low working capital whilst promoting practices that ensure sustainability in the supply chain (see Section 1.4.8.5).

Objective 2: Working capital practices were extracted from the selected sources and analysed in section 1.4.8 which also forms part of the practices identified.

Objective 3: An analysis of the connections between supply chain and procurement with overall firm financial performance was conducted. The accounting link between working capital, the ROCE profitability ratio was discussed. The accounts influenced by supply chain and procurement functions were identified as accounts receivables, inventory and accounts payable. This enabled establishing a common goal for each of the areas of management involved in improving cash (see section 1.4.5.3). Then an analysis of working capital, supply chain and procurement management principles were performed to detect areas of alignment (see section 1.4.7).

Objective 4: An effort was made to determine poor management practices to connect them with their corresponding best practices throughout the chapter. Gaps in best practice were summarised in the maturity assessment tables displayed in Section 1.5 (see sub sections 1.5.3.1; 1.5.3.2; 1.5.3.3; 1.5.3.4). Practices analysed are focused on the main working capital components (e.g. receivables, inventory and payables) as well as enabling areas of management, which include organising the business and policy development for working capital management.

Objective 5: A maturity assessment was designed and built up throughout Chapter 1.4. Three maturity elements were studied: Working Capital Awareness (see Section 1.5.3.1), Working Capital, Supply Chain and Procurement management alignment (see Section 1.5.3.2), Scope of Activities (see Section 1.5.3.3). This maturity assessment framework can be used as a reference to what best practice working capital entails. It can also enable the detection of lagging areas within a business that need to be addressed.

Table 1.14 Scope of Activities

Objective	Section reference
RO1: Review the existing academic and practitioner literature to identify the relevant trends related to working capital management	1.4.5. Relevance of Working Capital 1.4.6 Working Capital Management Strategies 1.4.9 Supply Chain Finance
RO2: Identify the common and effective working capital management practices	1.4.8 Working Capital Activities

RO3: Identify the working capital management implications on the procurement and supply chain functions	1.4.5.2 Connecting Supply Chain, Procurement and Working Capital 1.4.7 Aligning the management of Supply Chain, Procurement and Working Capital
RO4: Discuss the common gaps in best practice working capital management	1.5.3.1 Working Capital awareness 1.5.3.2 Working Capital and Supply chain and Procurement Alignment 1.5.3.3 Scope of Activities
RO5: Provide a maturity framework for best practice working capital management for supply chain and procurement functions	1.5.3.1 Working Capital awareness 1.5.3.2 Working Capital and Supply chain and Procurement Alignment 1.5.3.3 Scope of Activities

1.7 Limitations and Critique

The SLR was chosen to allow a thorough, unbiased and auditable examination. Nevertheless subjectivity, while limited, will be unavoidable through keyword selection, language requirements and application of criteria.

1.8 Future Research

This chapter highlights some of the commonly accepted best practices for working capital management. Alignment between working capital and supply chain and procurement is not possible but should be an objective of management through the definition of carefully thought-out trade-offs. Whilst this chapter focuses on the manufacturing context, many other sectors deserve the attention and focus of future studies. Working capital management theory could benefit from further cross-sectoral analyses to include services, retail, and other relevant industries. Further empirical research, comparing balance sheet information, should be performed based on data collection from the industry in order to provide more depth of knowledge on the working capital profile of companies. Business size also appears to be an important element to take into consideration for future research as working capital constraints differ between smaller, SME type businesses and larger corporations. Other areas of analysis include performance measurement as this chapter only touches the surface of main working capital performance measures. Finally, the maturity framework provided in this chapter includes two levels of maturity, lagging and leading. Further research should be

conducted to identify intermediary levels of maturity, enabling a stepped approach towards best practice.

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APPENDICES

Appendix A Reviewed Sources References

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