

The Evolution of Working Capital Management Research

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Abstract: This study aims to develop an understanding about the evolutionary process of Working Capital Management (WCM) research, explaining WCM in particular environments from the 1900's until the present. The study discusses relevant studies in the literature, exploring the relevance of models, concepts or frameworks developed to serve managers needs in particular operating environments and speculating future research directions. The evolution of WCM and influencing factors illustrate the integrative nature of WCM, appears to be dynamic as changes in managerial focus would reflect how companies manage WCM components. However, the review reveals that the WCM literature unable to provide relevant information to explain WCM in current environment. The study is particularly value in making sense of WCM research today and likely future directions. The pathway of development while vital for research exposes needs and responds that is fundamental for forecast of future prospects of WCM.

Key words: Operating environment, organizational context, theory and practice, working capital management, forecast

INTRODUCTION

WCM has gone through succession developmental stages, since early introduction in early 20th century. In any stage managers acts as problem provider and academics on to find solution/s while it is true to assume that scholars provide new horizons while managers implement finds to prove usefulness. The evolution of WCM is full of such two way debate between managers and academicians. Nevertheless, making sense of WCM research today and likely future directions requires an in-depth understanding of historical perspectives. The pathway of development while vital for research exposes needs and responds that is fundamental for forecast of future prospects of WCM. This study aims to develop an understanding from extant literature about the development of WCM research, explaining WCM in particular environments from the 1900's until the present. This includes exploring two agendas in relation to working capital; 1st, the evolution of WCM research which includes major transition stages along the journey and second factors influencing the management of working capital. In doing so, the relevance of models, concepts or frameworks developed to serve managers needs in particular operating environments will be examined. The review explores the gap in WCM literature to facilitate

managers and academicians in terms of managing working capital in contemporary organizational contexts and also speculates future research directions.

THE WCM JOURNEY

In this study, the review of WCM literature examines the journey of working capital research from the earliest awareness era (1900-1940s) to a pre and post World-War II era (1920-1950s) to the optimization and simulation approaches of working capital in the industrialisation era (1950-1980s) and the emerging themes of WCM research in the globalisation era (1990-2000s). Following studies will explore the important issues associated with the evolving development of WCM research in these different periods.

Awareness era (1900-1940s): The period between the 1900 and 1940s found limited development in WCM research as a discrete management practice, largely due to limited research. A search of the ABI Inform Database found only 23 studies related to working capital published in various journals in this period and there appeared to be an inconsistent interpretation of what was included within the term working capital. Disputes over definitions and categorizations of working capital indicate a learning

stage, developing an understanding of working capital characteristics and seeking common ground between working capital theory and practice.

One of the earliest definitions of working capital was proposed by Mann (1918). He defined working capital, as the amount of money or money equivalent required to finance a company's operations. It is also known as Net Working Capital (NWC), the amount of capital required keeping a company in operations or staying liquid. NWC is a reflection of the operating cycles, financing alternatives and liabilities obligations.

In 1947, the Committee on Accounting Procedure of American Institute of Accountants issued an Accounting Research Bulletin (ARB), No. 30 which defined working capital and classified the operating cycle. It stated:

Working capital, sometimes called net working capital is represented by the excess of current assets over current liabilities and identifies the relatively liquid portion of total enterprise capital which constitutes a margin or buffer for meeting obligations to be incurred and liquidated within the ordinary operating cycle of the business (CAP/ATA, 1947)

ARB No. 30 specified the operating cycle for current assets and current liabilities to be 12 months because many transactions fall within this time period. However, it also acknowledged the existence of longer business cycles in certain industries where companies may use extended periods for example wineries, lumber and agriculture. This bulletin was criticized by practitioners for its inconsistency with practices. The current review suggests that two important issues identified during this period are disputes over operating cycles of working capital and specifications of current assets and current liabilities.

Swartz (1947) argued that ARB No. 30's requirement of the operating cycle being defined, as being 12 months was inconsistent with practice. He explained that certain companies may produce two or more products that have different operating cycles. In a sense, this creates confusion for accountants in relation to products which differ in terms of operating cycles.

The classifications of items that can be considered as current assets or current liabilities in ARB No. 30 sparked arguments from practitioners. For example, ARB No. 30 excluded from current assets the deferred expenses or unallocated costs which normally benefited companies in long-term. Swartz (1947) argued that accountants using their own judgement and with limited guidance had to distinguish between deferred charges and prepaid expenses in the balance sheet. In general, he disagreed

that accountants may not be able to determine or categorise what could be included or excluded in current assets due to borderlines cases.

Swartz (1947) also explained that the exclusion from current liabilities of contractual obligations (e.g., prepaid rentals) that were expected to be refunded. He raised doubts about accountants having to make judgements about what would happen in the near future and what should or should not be included in the balance sheet. Further, he commented that ARB No. 30 had diverted the orientation of the balance sheet from disclosing what has happened to what was expected to happen.

LIQUIDITY AND FINANCING: PRE AND POST WORLD-WAR II PERIOD (1920-1950s)

The pre and post World-War II (WWII) era (1920-1950s) had significant influence on the development of working capital studies. The overlapping period between awareness stage and this era was due to similar operating environments and evidence (development of working capital) appeared in both periods. The main arguments in this period is revolved around appropriate levels and financing of working capital. Benjamin (1939) stated that companies were better off having positive NWC as it would improve liquidity. Positive NWC refers to companies keeping higher ratios of current assets (e.g., cash, receivables or inventories) to current liabilities (e.g., payables, prepaid expenses) and depending less on bank loans or supplier's credits to finance working capital requirements. Alternately, a low current ratio refers to companies having low current assets (e.g., reduced cash or minimized inventory levels) and higher current liabilities which increases dependency on financing (e.g., banks loans) for working capital requirements.

According to Chandler (1994), interwar (between WWI and II), American companies expanded their international market shares and even dominated British Domestic Markets. He highlighted how large American corporations having high capital capabilities and economies of scale were important factors to compete in this period. In terms of working capital, Ketchum (1942) identified that many American companies in the 1920s preferred to offer equity market securities to finance working capital while in the 1930s many companies were able to fund their own working capital activities and decrease dependency on bank loans. This indicates that during this period, companies preferred to adopt positive NWC approach to managed working capital activities.

Chandler (1994) further stated the World-war II period saw an extraordinary increase in industrial output with more than half of American manufacturing capacity was

dedicated to producing armed forces related products. Consequently, the requirement for working capital dramatically increased (Ketchum, 1942). Companies who were normally in-favour of issuing equity market securities (common stocks) to finance their working capital or financing working capital on their own, experienced difficulties due to investors reaction to the uncertainties of war, the rising cost of materials, higher labour costs and need for new plant to fulfil higher demands. Furthermore, Ketchum (1942) observed that companies fell short on cash and switched to banks, as alternative to finance working capital. This indicates a trend away from positive NWC approach to a low current ratio approach to managing working capital.

The tendency of American companies to finance working capital through bank loans increased as the war intensified, however banks were becoming reluctant to provide financing due to risks and uncertainties of war (Ketchum, 1943). Therefore, the US government was forced to inject funds into American companies for the construction of new plants and machinery and to help fund working capital requirements. This had a flow-on effect after the war.

According to Chandler (1994), post WWII, large capital intensive corporations with advance technology dominated the emerging markets. For example, he observed that International Business Machines (IBM) conquered the rapidly growing computer sector and Boeing and Douglas dominated the commercial airlines industry. Consequently, the practice of working capital appeared to reflect a change in organizational focus. American companies had regained strong liquidity positions with total current assets exceeding current liabilities by end of 1940s (Carey, 1949). This indicates that companies switched back to adopt the positive NWC approach to managing working capital. As this area, became more complex, researchers put more effort into developing various techniques to manage working capital operations.

OPTIMIZATION AND SIMULATION MODELS: INDUSTRIALISATION PERIOD (1950-1980s)

The industrialisation era between 1950 and 1980s resulted in a change of direction in working capital studies. Advanced technologies and machinery transformed manufacturing sectors, enabling companies to gain benefits of economic of scale hence lowering operational cost (Kaplan, 1994). Chandler (1994) identified that after the 1950s, American companies grew in size and created multiple divisions to focus on many different business activities. He explained that senior managers lacked the necessary training and experience to evaluate the performance of different business activities and a

range of mathematical models were used to support their decision making processes. Consequently, working capital studies in this period developed various mathematical and simulation models to help managers. Gentry (1988) provides a summary of research into optimization models and working capital. He states that optimization models can be categorized to support managers and academicians for specific function and purpose.

Indeed, several scholars have seen the potential for mathematical solutions to lower WCM requirements by linking together two or more of working capital components (Beranek, 1963; Kim and Chung, 1990; Shapiro, 1973; Thompson, 1975). For example, inventory levels (e.g., high or low) influence the determination of credit discount policy (Beranek, 1963) and conversely, the length of credit period influences inventory levels (Thompson, 1975).

As a consequence, the development of working capital studies placed more emphasis on developing mathematical models, as decision making tool for WCM components. Beranek (1963) introduced a simultaneous decision making model between cash discount policy and inventory levels. He suggested the optimal cash discount rate depended on the level of inventory (higher inventory levels indicating better offerings on cash discount rate). Shapiro (1973) proposed a credit policy model in inflationary and devaluation environments. Usually, during recession consumers are likely to slow their payments, so Shapiro's Model was designed to determine the length of credit period. Furthermore, Shapiro's Model determined the optimal time of purchasing the inventory. Thompson (1975) introduced the use of capital budgeting technique to determine optimal inventory levels. He explained the need to re-evaluate the Economic Order Quantity (EOQ) of inventory management when credit policies were assumed to be affected during economic downturns. Kim and Chung (1990) argued that previous studies would result in constant change of credit policy and could result in companies losing customers. They proposed a joint evaluation of inventory and account receivables to determine suitable cash flow approaches needed for operations management.

Many optimization solutions have received criticisms due to their lack adaptability in differing organizational settings and business environments (Damon and Schramm, 1972; Knight, 1972; Merville and Tavis, 1973). Knight (1972) highlighted the shortcomings of optimization models in dealing with uncertainties and risks in working capital. He suggested a combination of simulation and optimization models to resolve the shortcomings of using mathematical models alone in the budgetary process when identifying the parameters (i.e., sales volume, inventory level, credit policy).

Subsequently, scholars diverted their efforts to incorporating simulation models into the management of working capital components. Damon and Schramm (1972) developed a decision making model to identify the optimal level of working capital by identifying parameters in production, finance and marketing. Next, Merville and Tavis (1973) proposed an interlocking planning model where decisions about receivables, inventory and financing components were linked. Then, Bierman *et al.* (1975) demonstrated a ruin consideration model that linked working capital with capital structure. They proposed the working capital decisions should be linked with other functional units (production, marketing and finance) not only to avoid ruin (e.g., technically insolvent) but also to improve sales through changing inventory levels and credit policies.

While working capital research in this era offered alternatives for improving working capital performance, the usefulness of optimization and simulation models to practitioners were not appreciated until a survey by Gitman *et al.* (1979). They found that managers in large corporations in the United States tended to use sophisticated financial techniques in managing working capital activities. They also confirmed that managers used optimization and simulation models to improve their manufacturing capabilities and increase profitability through minimizing production costs.

However in a challenging and dynamic business environment, decision making processes using mathematical and simulation models are difficult to configure in complex organizational settings. A survey by Trahan and Gitman (1995) found that optimization and simulation models lack broad acceptance by many chief financial officers of the Fortune 500 largest corporations and the Forbes 200 best small companies because of their inflexibility. Recognising these challenges and opportunities, new streams of working capital studies have emerged.

EMERGING THEMES: GLOBALIZATION PERIOD (1990s-PRESENT)

In previous study, working capital literature review exposed the shortcomings of optimization and simulation approaches to assist managers in interpreting and making sense of diverse information which has become increasingly important to compete in the globalisation era of global competition, advance technologies and innovative products and services (Harrison and McKinnon, 2007). About two themes are emerging in this era, effectiveness in WCM and understanding WCM practices which will be discussed in this study.

Effectiveness WCM: Effective WCM revolves around two important variables, namely profitability and liquidity (Pass and Pike, 1984; Shin and Soenen, 1998). Pass and Pike (1984) further argued that effective management of working capital components is imperative to improve organizational performance. As profitability is a subjective term and can be interpreted in different ways, it is crucial to specify Pass and Pike's definition of profitability as maximizing shareholder value. As mentioned earlier, liquidity is concerned with the ability of a company to satisfy its financial obligations on day to day basis (Moyer *et al.*, 2009). Furthermore, two differing notions are identified, believed to contribute to effective WCM; namely financial perspective and organizational context.

From a financial perspective, WCM studies suggested effective WCM could be achieved by improving the cash conversion cycle to incorporate performance. As previously mentioned, the notion of shortening the cash conversion cycle (similar to squeezing WCM components) leads to positive liquidity (Richards and Laughlin, 1980) and improved profitability (Johnson and Soenen, 2003). A pioneer study was conducted by Shin and Soenan (1998) who found a significant relationship between shortened cash cycles and an improvement in profitability among American companies. Later studies found similar results in countries like Greece (Lazaridis and Tryfonidis, 2006), India (Vishnani and Shah, 2007), Kenya (Mathuva, 2010) and Malaysia (Mohamad and Saad, 2010; Zariyawati *et al.*, 2009). Similar results were also found for small and medium size enterprises (Garcia-Teruel and Martinez-Solano, 2007).

In contrast, differing conditions, identified in Belgium (Deloof, 2003) and Pakistan (Raheman and Nasr, 2007), gave rise to profitable companies paying suppliers early or within the discount period with managers preferring to gain savings from early payments which could improve profit margins. Some studies conclude that squeezing WCM components is an alternative to maximizing profitability and the effectiveness of WCM is seen merely in financial terms. Alternatively, some companies may take advantages of cash discounts to improve profitability.

It should be noted that the message conveyed with the squeezing approach arguably hinders the establishment of a healthy financial supply chain (Brigham and Ehrhardt, 2008; Hofmann and Kotzab, 2010; Moyer *et al.*, 2009; Rafuse, 1996). One of the elements in a squeezing approach is stretching payment to suppliers, however, this is considered unequal distribution of power (Hofmann and Kotzab, 2010). Delaying payments to suppliers could involve stakeholders in multiplying effects with companies growing at the expense of suppliers and customers. Instead, companies are advised

to leverage cross-enterprise collaboration to gain a competitive edge (Hofmann and Kotzab, 2010) as synchronizing the flow of inventories and payables within the supply chain would benefit the whole value chain. Cross-enterprise collaboration refers to an integrative platform where members of a supply chain share information and cooperatively develop strategic plans to synchronize operations (Bowersox *et al.*, 2003).

In fact, many scholars have suggested that strategic collaborations of cross-enterprise segments to fulfil market demand may influence WCM (Bowersox *et al.*, 2003; Mohr *et al.*, 1996; Mollenkopf *et al.*, 2000; Wadhwa *et al.*, 2006; Wood, 1993). Further researchers expressed the view that improving communication channels between manufacturers, suppliers and retailers through information sharing platforms may reduce the uncertainty inherent in market behaviour. Consequently, companies could more effectively manage their WCM activities and production plans.

From organizational context, researchers have suggested that establishing effective WCM transcends finance and largely depends on other disciplines (Brigham and Ehrhardt, 2008; Gitman, 2009). As mentioned earlier, the process of managing working capital components is an important part of managing business operating cycles and involves the participation of a wide range of people within an organization (Gitman, 2009; Schilling, 1996). A typical operation cycle involves three main activities: Purchasing, producing and selling (Moyer *et al.*, 2009). These activities involve cash flows that are neither instantaneous nor synchronized. In normal business operation, companies have to purchase materials (for production) in advance payment (payables) in most of the times is made before cash receipts (cash collection from receivables). In large companies, working capital transactions are complex and accountability for managing WCM components is distributed among a range of finance managers (Gentry *et al.*, 1979) hence, the decision making process regarding working capital components should be synchronized in order to maximize profitability.

The area of WCM studies focusing on organizational contexts is currently underdeveloped. Scholars have proposed alternatives derived from organizational contexts to improve WCM such as information technology for coordination (Fairchild, 2005), six Sigma to reduce root causes of problems (Srisvastava, 2004), horizontal organizational structure to improve adaptability to consumer demands (Sehgal *et al.*, 2006) and Just In Time (JIT) strategy to improve supply chains (Bartezzaghi *et al.*, 1992). Similarly, managing working capital strategically in organizational contexts has the potential to build an effective management tool for working capital components.

The shortcomings of the financial perspective hindered managers interpreting and making sense of diverse information which has become increasingly important when competing in the globalization era with emerging global competition, advanced technologies and innovative products and services (Harrison and McKinnon, 2007). This raises the need to explore WCM in organizational contexts to better help managers and academicians explain WCM practices in the current environment.

Understanding WCM practices: An extensive literature review found that many WCM studies have been investigating WCM practices from the late 1970s till present. Many of these studies were interested to learn about management's perceptions of working capital approaches and the mail survey approach has dominated this research stream.

Previous studies suggest that particular working capital approaches are associated with how companies organize the levels of WCM components. There are two main working capital approaches identified in the literature, namely the situational changes and risk avoiding approaches. Situational changes refers to the flexibility of working capital policy to adapt to changes in demand (Smith and Sell, 1980). For example, companies are observed to carry high levels of inventory to avoid stock-out situations or offer attractive receivables or payables terms to induce business. In contrast, risk avoiding is less flexible, working capital policy is more static and there is a greater tendency to minimize levels of WCM components (the previously mentioned squeezing approach) (Smith and Sell, 1980).

Researchers have found that many companies have used risk avoiding approach to minimize levels of WCM components (Belt and Smith, 1991; Gentry *et al.*, 1979). Gentry *et al.* (1979) found that large proportion of companies in France, India and the US preferred to minimize the level of WCM components to just enough to support anticipated sales during the planning period.

Alternatively, there is also evidence that some companies offer flexibility in working capital policy to adapt to changes in demand. A study by Belt and Smith (1991) showed that Australian companies adopted situational changes and indicated these companies were more flexible in terms of working capital policy to enable WCM components to be more adaptable to changes in their environment. This may be due to the Australian economy being driven by commodity export-oriented firms where flexibility to meet demands is essential. Similarly, Gentry *et al.* (1979) found that a large proportion of Belgian companies adopted situational changes and held additional levels of WCM components to cater for sudden increases in demands and production costs for

example. A comparable result was identified in Canada by Khoury *et al.* (1999) where companies adopted a situational changes approach, being flexible in terms of working capital policy.

Extent literature offers important insights into WCM practices. However, it is argued that these studies employed a narrow focus on management tendencies to build effective WCM practices considering a financial perspective alone. The operational scope of WCM is broader and involves consideration of multiple internal and external factors; consequently little is known about WCM practices in complex organizational settings.

FACTORS INFLUENCING THE MANAGEMENT OF WORKING CAPITAL

The effectiveness of WCM and understanding practices as described in the previous study, continues to be the main themes in the globalization era and organizational context is considered an alternative approach to improving effectiveness. Managers are urged to consider various factors in decision making processes because the more volatile market conditions are the more resources and the greater coordination required to manage WCM components (Hill *et al.*, 2010). Consequently, this study aims to develop an understanding from the literature of factors that have influenced current WCM practices.

It is evident that there are a wide range of factors affecting WCM practices. These factors can be categorized, as external and internal factors as shown in Table 1. While external factors may affect many companies globally and across industries, there are certain factors only affecting companies within a particular industry or country. At an organizational level, a set of internal factors affects the whole organization, including WCM but in different manners, according to

their direction and relationships between them. Consequently, an ability to interpret and respond to changes in these environmental variables is critical (Johnson and Soenen, 2003) for management, including managers who are involved in WCM decision making processes. The following paragraphs describe identified factors and their level of influence on WCM.

The review of the literature identified six external factors believed to influence WCM in a mostly holistic manner: Political situation, economic and business environment, industrial effects, legislation, competition and financial regulations. The review further found that their effect varies across industrial and geographical settings. For example, United Kingdom legislation addresses how small business holders go about charging interest on overdue invoices (Peel *et al.*, 2000) to protect small enterprises who are highly dependent on efficient working capital while many companies have encountered difficulties in managing working capital components during economic recessions due to global uncertainties (Claessens *et al.*, 2000). In other words, legislation may have only localised, limited effects while economic conditions appear to affect many companies across industries or borders and some companies are more sensitive to environmental changes than others.

The current review also identified eleven internal factors that are considered to affect WCM: managerial practice, working capital policy, performance measurement systems, information technology, employees behaviour, investment policy, production and supply chain management, payables management, credit policy and employees financial knowledge. The review suggests that these factors seem to affect an organisation as a whole but certain factors may specifically impact WCM components. For example, implementation of a performance management and measurement system is aimed to strategically improve overall organizational

Table 1: The internal and external factors affecting WCM

Factors	What may affect WCM	References
External factors	Political situation	(Ketchum, 1942, 1943; Carey, 1949)
	Economic and business environment	(Herbst, 1974; Ben-Horim and Levy, 1983; Claessens <i>et al.</i> , 2000)
	Industrial effects	(Hawawini <i>et al.</i> , 1986; Filbeck <i>et al.</i> , 2007; Smith, 1997)
	Legislations	(Peel <i>et al.</i> , 2000)
	Competitions	(Filbeck and <i>et al.</i> , 2007)
	Financial institutions/interest rates/regulations	(Holdren and Hollingshead, 1999; Strischek, 2001; Cocheo, 2004)
Internal factors	Technology	(Fairchild, 2005; Wood, 1993)
	Management practices/working capital policy	(Knight, 1972; Deloof, 2003; Edwards <i>et al.</i> , 1985; Fredenberger <i>et al.</i> , 1993; Garcia-Teruel and Martinez-Solano, 2007; Johnson and Soenen, 2003; Lazaridis and Tryfonidis, 2006; Sathyamoorthi, 2002; Boisjoly and Izzo, 2009; Hill <i>et al.</i> , 2010)
	Performance measurement systems	(Srisvastava, 2004)
	Information technology	(Fairchild, 2005; Jaiswal and Kaushik, 2005)
	Employees behaviours	(Loeser, 1988)
	Investment policy	(Seidner, 1990; Appuhami, 2009)
	Production and supply chain management	(Bartezzaghi <i>et al.</i> , 1992; Evans <i>et al.</i> , 1993; Hamlin and Heathfield, 1991)
	Shareholders wealth	(Filbeck <i>et al.</i> , 2007)
	Inventory management	(Edwards <i>et al.</i> , 1985; Raman and Kim, 2002; Yang <i>et al.</i> , 2005)
	Payable management	(Rafuse, 1996; Kolay, 1991)
	Credit policy	(Walia, 1977; Kolay, 1991; Ooghe, 1998)
Employees financial knowledge	(Cheatham and Cheatham, 1993; Gitman and Maxwell, 1985)	

performance (Srisvastava, 2004) and involves participation of all members of the organisation. Alternatively, changes in working capital policy would specifically affect WCM performance. For example, receivables policy specifies terms and conditions in approving credit applications and cash collection activities and an inventory handling policy specifies how materials should be maintained and organized. If a company intends to shorten the cash conversion cycle, managers may squeeze elements of working capital policy to conserve cash, a move likely to influence working capital performance. These examples indicate how certain internal factors are most likely to affect WCM while others affect the organization as a whole.

Information gained from internal and external factor is very broad and fragmented which makes it difficult for managers and scholars to speculate what actions are needed and how working capital components should be managed. Basically such analysis is unable to provide a clear and comprehensive understanding of how internal and external factors affect WCM practices. Although, these factors are intuitively important in WCM decision making processes, a detailed and comprehensive understanding is necessary to help managers and academicians have a more robust explanation of WCM.

WCM RESEARCH-LACK OF UNDERSTANDING

This study reconciles the development eras of WCM research as illustrated in Fig. 1. As discussed in preceding sections, the evolution of WCM witnessed

major transitions in WCM research to accommodate managers changing preferences in response to particular organizational focuses and operating environments. Furthermore, this study also extended the review of literature to gain an understanding of factors influencing WCM practices. This section aims to discuss the relevance issue of current WCM research in an organizational context and in the following study, suggests future research direction.

The awareness and pre and post WWII eras saw increasing participation of practitioners and academicians in developing an understanding of working capital characteristics through series of debates. Main arguments revolved around the level of liquidity and financing working capital requirements. The development of WCM studies offered managers recommendations for dealing with opportunities and challenges in that period. For example, American corporations realised that strong liquidity positions and economies of scale would give them a competitive edge to dominate international markets and survive through the uncertainties of World War II (Chandler, 1994).

In the industrialisation era, managers were struggling to cope with the rapid growth of their organizations and lacked knowledge and experience regarding many different business activities. In response, working capital studies proposed various optimisation and simulation models to assist managers with a statistical approach to decision making processes. This was in line with American companies who had experienced dramatic growth into emerging markets and the needs for

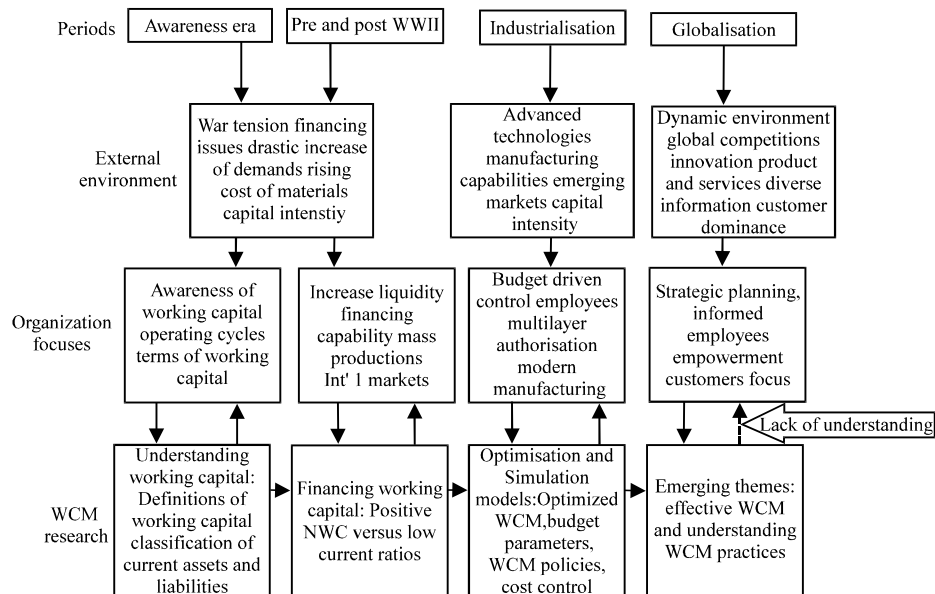


Fig. 1: The chronology of evolution of WCM research

mathematical models and budget oriented tools to compete in that environment (Chandler, 1994; Johnson and Kaplan, 1991).

In the current globalization era, the effective management of working capital is one of the most important agendas when competing in the emerging, global competition where information is paramount in making sense of market directions. It is apparent that sophisticated financial models alone are unable to help managers and academicians with a more robust explanation of WCM, hence organizational contexts are undeniably important to improving organizational performance. The earlier review of WCM practices identified that scholars are more interested in learning about managerial practices primarily from a financial point of view. As stated earlier, the scope of WCM practices embedded within an organizational context needs a more holistic view of managerial practices (Brigham and Ehrhardt, 2008). Consequently, the overall process of WCM which may be highly or loosely coordinated within the organizational context is not fully understood.

WCM involves the full range of business processes, so the decisions made regarding working capital components should be synchronized in order to maximize organizational performance (Crum *et al.*, 1983). However, a study in New Zealand by McInness (2000) showed that 94% of companies manage WCM components in a more segregated manner. This differs from suggestions by WCM researchers that effective WCM should be integrated along the processes in order to maximize organizational performance (Arcelus and Srinivasan, 1993; Crum *et al.*, 1983; Damon and Schramm, 1972). Managers need concepts, models and frameworks to be more flexible and dynamic. Unfortunately, the WCM literature lacks explanations of how companies should manage WCM components in complex organizational settings.

Accordingly, it is apparent that WCM research unable to provide relevant information to managers for managing working capital activities in current environments. This phenomenon is comparable to that which Johnson and Kaplan (1991) highlight in their seminal discourse *Relevance Lost: The Rise and Fall of Management Accounting* where they observed that information obtained from financial reports is unrealistic in providing understanding of the complexity of contemporary organizational settings.

The evolution of WCM has shown that changes in managerial practice should influence the management of working capital. For example, the use of sophisticated financial models enabled managers to make decisions in response to the need to lower costs during the industrialization era. However, the use of sophisticated

financial models is rather irrelevant, as managers seem unable to apply them within the organizational context of the current environment.

An understanding of internal and external factors enables a dynamic view to be developed of WCM. In other words, each company may respond differently to each factor as the level of sensitivity of a company may influence how managers make decisions. For example, companies operating in hostile market conditions where managers are suspected to observe external factors more closely in decision making processes compared to less hostile market conditions. In this case, each company would react differently to its environment which may or may not influence the management of working capital. Unfortunately, the body of WCM knowledge is unable to provide a comprehensive understanding of how WCM components are managed in particular market conditions.

Taking together all the issues discussed in this study, it is evident that WCM practices are not fully understood in organizational contexts. WCM research lacks explanations as to how companies manage WCM components in complex organizational settings.

SUGGESTIONS FOR FUTURE RESEARCH

The emerging themes in globalization era are clearly dominated by financial perspectives. Scholars have been developing various sophisticated financial models to support managers in decision-making process but these techniques continuously been debated as unable to reflect the needs of managers to manage working capital and difficult to implement in complex organizational settings (Gitman *et al.*, 1979). The review of extant WCM literature suggests future research on three areas seeking sound WCM.

First, this study suggests that future studies should examine the practice of WCM within organization context would be a key area needing immediate attention. This could provide necessary information about different WCM approaches which will help academicians to formulate financial models that are more dynamic and applicable in complex organizational settings.

Second, it appears that the trends of WCM practices in various countries are somewhat identifiable but it needs to be continuously updated particularly in current environment. In other words, this study suggests that continuing research is required and the understanding and knowledge about WCM must also evolve.

Third, it is imperative to identify new forces that shaped working capital practices from international contexts, this includes considering other new variables

that may influence the management of working capital. For instance, the use of shared services or outsourcing services in managing WCM activities is increasingly implemented in many multinational companies (Leavell, 2006). Companies outsource parts of their working capital activities, such as receivables activities or payables services to shared services or outsourcing companies.

CONCLUSION

This study reviewed the WCM literature in order to gain an understanding to explain WCM in contemporary organizational contexts. The review explored the evolution of working capital research from the early 1900s until the present. The review of extant literature suggested four distinct eras describing major transitions in WCM research. The four periods are: Awareness era (1900-1940s), working capital in pre and post war era (1920-1950s) working capital in industrialisation era (1950-1980s) and emerging themes in the globalisation era (1990-2000s).

The review has been extended to examine the factors influencing WCM. A review of the literature identified a wide range of internal and external factors influencing WCM, however, the insight gained was insufficient to enable managers and academicians to manage or understand WCM practices in certain conditions.

This review concludes that current WCM literature lacks the understanding to describe WCM in an organizational context. Organizational contexts have undergone extensive changes with managers relying on multiple sources of information or measures to make better decisions in highly volatile markets (Simons, 1995). The relevance of WCM research in guiding managers during this globalization era is questionable, hence, this study is intended to propose future research to gain in-depth understanding of various WCM practices currently in used and continuous investigations about WCM practices from international perspectives. This may provide insights to a more comprehensive understanding of WCM in current environment.

REFERENCES

Appuhami, R., 2009. Corporate investments and the dual-role of working capital: Evidence from Thailand. *J. Applied Manage. Account. Res.*, 7: 53-62.

Arcelus, F.J. and G. Srinivasan, 1993. Integrating working capital decisions. *Eng. Econ.*, 39: 1-15.

Bartezzaghi, E., F. Turco and G. Spina, 1992. The impact of the just-in-time approach on production system performance: A survey of Italian industry. *Int. J. Operations Prod. Manage.*, 12: 5-17.

Belt, B. and K.V. Smith, 1991. Comparison of working capital management practices in Australia and the United States. *Global Finance J.*, 2: 27-54.

Ben-Horim, M. and H. Levy, 1983. Management of accounts receivable under inflation. *Financial Manage.*, 12: 42-48.

Benjamin, H.S., 1939. Current ratio or net working capital. *J. Accountancy*, 67: 364-365.

Beranek, W., 1963. *Analysis for Financial Decisions*. R.D. Irwin, Homewood, IL.

Bierman, H., K. Chopra and J. Thomas, 1975. Ruin considerations: Optimal working capital and capital structure. *J. Financial Quantitative Anal.*, 10: 119-128.

Boisjoly, R.P. and S. Izzo, 2009. The cash flow implications of managing working capital and capital investment. *J. Bus. Econ. Stud.*, 15: 98-108.

Bowersox, D.J., D.J. Closs and T.P. Stank, 2003. How to master cross-enterprise collaboration. *Supply Chain Manage. Rev.*, 7: 18-27.

Brigham, E.F. and M.C. Ehrhardt, 2008. *Financial Management: Theory and Practice*. 12th Edn., Thomson South-Western, Mason, OH.

CAP/AIA, 1947. Current assets and current liabilities: Working capital. *J. Accountancy*, 84: 282-285.

Carey, J.L., 1949. Corporation working capital increases. *J. Accountancy*, 87: 459-460.

Chandler, A.D., 1994. The competitive performance of US industrial enterprises since the second world war. *Bus. History Rev.*, 68: 1-72.

Cheatham, L. and C. Cheatham, 1993. Utilizing financial statements as cash flow planning and control tools. *Managerial Finance*, 19: 35-49.

Claessens, S., S. Djankov and L.C. Xu, 2000. Corporate performance in the East Asian financial crisis. *World Bank Res. Observer*, 15: 23-46.

Cocheo, S., 2004. Bring us your rejects or factoring for profitability. *ABA Banking J.*, 96: 16-18.

Crum, R.L., D.D. Klingman and L.A. Tavis, 1983. An operational approach to integrated working capital planning. *J. Econ. Bus.*, 35: 343-378.

Damon, W.W. and R. Schramm, 1972. A simultaneous decision model for production, marketing and finance. *Manage. Sci.*, 19: 161-172.

Deloof, M., 2003. Does working capital management affect profitability of Belgian firms? *J. Bus. Finance Account.*, 30: 573-588.

Edwards, J.R., H.M. Wagner and W.P. Wood, 1985. Blue Bell trims its inventory. *Interfaces*, 15: 34-52.

Evans, G.N., M.M. Naim and D.R. Towill, 1993. Dynamic supply chain performance: Assessing the impact of information systems. *Logistics Inform. Manage.*, 6: 15-25.

- Fairchild, A., 2005. Intelligent matching: Integrating efficiencies in the financial supply chain. *Supply Chain Manage.*, 10: 244-248.
- Filbeck, G., T.M. Krueger and D. Preece, 2007. CFO magazine's working capital survey: Do selected firms work for shareholders? *Q. J. Bus. Econ.*, 46: 3-22.
- Fredenberger, W.B., A. DeThomas and H.N. Ray, 1993. Information needs of firms in financial distress. *Int. J. Inform. Manage.*, 13: 326-340.
- Garcia-Teruel, P.J. and P. Martinez-Solano, 2007. Effects of working capital management on SME profitability. *Int. J. Manage. Finance*, 3: 164-177.
- Gentry, J.A., 1988. State of the art of short-run financial management. *Financial Manage.*, 17: 41-57.
- Gentry, J.A., D.R. Metha, S.K. Bhattacharyya, R. Cobbaut and J.L. Scaringella, 1979. An international study of management perceptions of the working capital process. *J. Int. Bus. Stud.*, 10: 28-38.
- Gitman, L.J. and C.E. Maxwell, 1985. Financial activities of major U.S. firms: Survey and analysis of Fortune's 1000. *Financial Manage.*, 14: 57-65.
- Gitman, L.J., 2009. *Principles of Managerial Finance*. 12th Edn., Pearson Prentice Hall, Boston, MA., USA., ISBN-13: 978-0138011239, Pages: 1128.
- Gitman, L.J., E.A. Moses and I.T. White, 1979. An assessment of corporate cash management practices. *Financial Manage.*, 8: 32-41.
- Hamlin, A.P. and D.F. Heathfield, 1991. Competitive management and working capital. *Manager. Decis. Econ.*, 12: 207-217.
- Harrison, G. and J. McKinnon, 2007. National Culture and Management Control. In: *Issues in Management Accounting*, Hopper, T., R.W. Scapens and D. Northcott (Eds.). 3rd Edn., Prentice Hall, New York, USA., ISBN-13: 9780273702573, pp: 93-117.
- Hawawini, G., C. Viallet and A. Vora, 1986. Industry influence on corporate working capital decisions. *Sloan Manage. Rev.*, 27: 15-24.
- Herbst, A.F., 1974. Some empirical evidence on the determinants of trade credit at the industry level of aggregation. *J. Financial Quantitative Anal.*, 9: 357-394.
- Hill, M.D., G.W. Kelly and M.J. Highfield, 2010. Net operating working capital behavior: A first look. *Financial Manage.*, 39: 783-805.
- Hofmann, E. and H. Kotzab, 2010. A supply chain-oriented approach of working capital management. *J. Bus. Logist.*, 31: 305-326.
- Holdren, D.P. and C.A. Hollingshead, 1999. Differential pricing of industrial services: The case of inventory financing. *J. Bus. Ind. Marketing*, 14: 7-16.
- Jaiswal, M.P. and A. Kaushik, 2005. Realising enhanced value due to business network redesign through extended ERP systems: Case study of HLLNet. *Bus. Process Manage. J.*, 11: 171-184.
- Johnson, H.T. and R.S. Kaplan, 1991. *Relevance Lost: The Rise and Fall of Management Accounting*. Harvard Business School Press, Boston, MA., USA., ISBN-13: 9780875842547, Pages: 269.
- Johnson, R. and L. Soenen, 2003. Indicators of successful companies. *Eur. Manage. J.*, 21: 364-369.
- Kaplan, R.S., 1994. Management accounting (1984-1994): Development of new practice and theory. *Manage. Account. Res.*, 5: 247-260.
- Ketchum, M.D., 1942. Working-capital financing in a war economy. *J. Bus. Univ. Chicago*, 15: 306-343.
- Ketchum, M.D., 1943. Plant financing in a war economy. *J. Bus. Univ. Chicago*, 16: 28-50.
- Khoury, N.T., K.V. Smith and P.I. MacKay, 1999. Comparing working capital practices in Canada, the United States and Australia: A note. *Can. J. Admin. Sci.*, 16: 53-57.
- Kim, Y.H. and K.H. Chung, 1990. An integrated evaluation of investment in inventory and credit: A cash flow approach. *J. Bus. Finance Account.*, 17: 381-389.
- Knight, W.D., 1972. Working capital management: Satisficing versus optimization. *Financial Manage.*, 1: 33-40.
- Kolay, M.K., 1991. Managing working capital crises: A system dynamics approach. *Manage. Dec.*, 29: 46-52.
- Lazaridis, J. and D. Tryfonidis, 2006. Relationship between working capital management and profitability of listed companies in the athens stock exchange. *J. Financial Manage. Anal.*, 19: 26-35.
- Leavell, H., 2006. International working capital management. *Bus. Rev.*, 5: 233-239.
- Loeser, D., 1988. Improving accounts receivable management. *J. Accountancy*, 166: 116-118.
- Mann, O.A., 1918. Working capital for rate-making purposes. *J. Accountancy*, 26: 340-342.
- Mathuva, D.M., 2010. The influence of working capital management components on corporate profitability: A survey on kenyan listed firms. *Res. J. Bus. Manage.*, 4: 1-11.
- McInnes, A.N.S., 2000. Working capital management: Theory and evidence from New Zealand listed limited liability companies. Master's Thesis, Lincoln University, New Zealand.
- Merville, L.J. and L.A. Tavis, 1973. Optimal working capital policies: A chance-constrained programming approach. *J. Financial Quant. Anal.*, 8: 47-59.
- Mohamad, N.E.A.B. and N.B.M. Saad, 2010. Working capital management: The effect of market valuation and profitability in Malaysia. *Int. J. Bus. Manage.*, 5: 140-147.

- Mohr, J.J., R.J. Fisher and J.R. Nevin, 1996. Collaborative communication in interfirm relationships: Moderating effects of integration and control. *J. Market.*, 60: 103-115.
- Mollenkopf, D., A. Gibson and L. Ozanne, 2000. The integration of marketing and logistics functions: An empirical examination of New Zealand firms. *J. Bus. Logist.*, 21: 89-112.
- Moyer, R.C., J.R. McGuigan and W.J. Kretlow, 2009. *Contemporary Financial Management*. 11th Edn., South-Western/Cengage Learning, Mason, OH., USA.
- Ooghe, H., 1998. Financial management practices in China: A case study approach to companies in the Shanghai region. *Eur. Bus. Rev.*, 98: 217-226.
- Pass, C.L. and R.H. Pike, 1984. An overview of working capital management and corporate financing. *Manage. Finance*, 10: 1-11.
- Peel, M.J., N. Wilson and C. Howorth, 2000. Late payment and credit management in the small firm sector: Some empirical evidence. *Int. Small Bus. J.*, 18: 17-37.
- Rafuse, M.E., 1996. Working capital management: An urgent need to refocus. *Manage. Dec.*, 34: 59-63.
- Raheman, A. and M. Nasr, 2007. Working capital management and profitability-case of Pakistani Firms. *Int. Rev. Bus. Res. Pap.*, 3: 279-300.
- Raman, A. and B. Kim, 2002. Quantifying the impact of inventory holding cost and reactive capacity on an apparel manufacturer's profitability. *Prod. Operat. Manage.*, 11: 358-373.
- Richards, V.D. and E.J. Laughlin, 1980. A cash conversion cycle approach to liquidity analysis. *Finance Manage.*, 9: 32-38.
- Sathyamoorthi, C.R., 2002. Management of working capital in selected co-operatives in Botswana. *Finance India*, 16: 1015-1044.
- Schilling, G., 1996. Working capital's role in maintaining corporate liquidity. *TMA J.*, 16: 4-7.
- Sehgal, S., B.S. Sahay and S.K. Goyal, 2006. Reengineering the supply chain in a paint company. *Int. J. Prod. Performance Manage.*, 55: 655-670.
- Seidner, A.G., 1990. Investing excess working capital. *Manage. Accounting*, 71: 24-27.
- Shapiro, A., 1973. Optimal inventory and credit-granting strategies under inflation and devaluation. *J. Financial Quant. Anal.*, 8: 37-46.
- Shin, H.H. and L. Soenen, 1998. Efficiency of working capital management and corporate profitability. *Finance Pract. Educ.*, 8: 37-45.
- Simons, R., 1995. *Levers of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal*. Harvard Business School Press, Boston, USA.
- Smith, K.V. and S.B. Sell, 1980. Working Capital Management in Practice. In: *Readings on the Management of Working Capital*, Smith, K.V. (Ed.) 2nd Edn., West Publishing Co., St. Paul, MN., USA., pp: 51-84.
- Smith, M.B., 1997. Significance testing for cross-sectional influences in working capital in industrial firms listed on Johannesburg stock exchange. *J. Financial Manage. Anal.*, 10: 33-36.
- Srisvastava, S., 2004. Using six sigma methodologies to optimize working capital management. *Corporate Finance Rev.*, 9: 29-37.
- Striscek, D., 2001. A banker's perspective on working capital and cash flow management. *Strat. Finance*, 83: 38-45.
- Swartz, H.V., 1947. A discussion of accounting research bulletin no. 30 current assets and current liabilities-working capital. *New York Certified Public Accountant*, 17: 834-837.
- Thompson, H.E., 1975. Inventory management and capital budgeting: A pedagogical note. *Dec. Sci.*, 6: 383-398.
- Trahan, E.A. and L.J. Gitman, 1995. Bridging the theory-practice gap in corporate finance: A survey of chief financial officers. *Q. Rev. Econ. Finance*, 35: 73-87.
- Vishnani, S. and B.K. Shah, 2007. Impact of working capital management policies on corporate performance: An empirical study. *Global Bus. Rev.*, 8: 267-281.
- Wadhwa, S., A. Kanda, K.S. Bhoon and Bibhushan, 2006. Impact of supply chain collaboration on customer service level and working capital. *Global J. Flexible Syst. Manage.*, 7: 27-35.
- Walia, T.S., 1977. Explicit and implicit cost of changes in the level of accounts receivable and the credit policy decision of the firm. *Financial Manage.*, 6: 75-78.
- Wood, A., 1993. Efficient consumer response. *Logist. Inform. Manage.*, 6: 38-40.
- Yang, G., R.J. Ronald and P. Chu, 2005. Inventory models with variable lead time and present value. *Eur. J. Oper. Res.*, 164: 358-366.
- Zariyawati, M.A., M.N. Annuar, H. Taufiq and A.A. Rahim, 2009. Working capital management and corporate performance: Case of Malaysia. *J. Modern Accounting Auditing*, 5: 47-54.