Research on the adoption of accounts receivable financing

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Abstract

This paper aims to investigate the manufacturers' adoption behavior of accounts receivable financing by incorporating the perspective of Supply Chain Management and Working Capital Management. This paper highlights the connection between the Supply Chain Integration (including operational management, relationship management, and supply chain informationization) and effectiveness of working capital management.

Keywords: Supply chain financing, Accounts receivable financing, Supply chain integration

INTRODUCTION

In the globalized world, the realization of stable supply chains in the Supply Chain

Management (SCM) is effective as it brings together both manufacturers and buying firms to respond to the global competition (Christopher, 1992; Thomas and Griffin, 1996; Cooper et al., 1997; Sahin and Robinson, 2002). Yet the progressive realization is recently highlighted by the increasing capital pressure of small and medium manufacturers and increasing supply disruption risks since the global financial crisis in 2008. In such a case, Supply Chain Financing (SCF) is increasingly popular (Demica, 2007) as it helps enterprises to alleviate the working capital pressure (Demica, 2014a).

This paper emphasizes the adoption of SCF from the operational perspective of supply chain organizations. It follows that, SCF, from the insights gained from literature – which, we will discuss later, refers to network-based external financing received from financial institutions (e.g. banks) to boost financial and operational efficiency of SCF financial clients with which the core firms have collaborative relationships. SCF enables the financial clients to leverage the core firms' credit quality or to borrow against particular financial assets (e.g. accounts receivable) for a better lending rate and loan conditions (Wuttke et al., 2013b). Based on different types of collaterals, there are three major types of SCF services: Accounts Receivable Financing (ARF), inventory financing, and prepayment financing (Camerinelli, 2009; More and Basu, 2013).

According to a business payment study recently released by a well renowned credit insurance and credit management services, Coface, credit selling becomes a mainstream in place of traditional practices for business-to-business transactions (Coface Group, 2014). In this selling situation, many small and medium manufacturers hold much accounts receivable, and end up panicking or even going bankrupt. To alleviate the working capital pressure, many of them rely on ARF (Demica, 2014b). Simply speaking, ARF refers to the short term financial arrangements in which the manufacturers use its accounts receivable, which is the money owed by company customer, as collateral to receive cash from the bank immediately at a discount. The bank has the right to collect all money from the buying customer and receive interests and service fees in the invoice money collection process (Shenzhen Development Bank Limited Company and China Europe International Business School, 2009).

As ARF is becoming a common practice for manufacturers to raise capital, it is important for us to understand the considerable thoughts behind employing the ARF in order to guide the manufacturers and core firms in choosing a more effective approach toward ARF. This paper integrates SCM theories with the practices of Working Capital Management (WCM) to empirically explore the influence of manufacturers' SCM that impacts the development of WCM, capital needs and the ARF adoption behavior. In this way, we hope that our paper, which is believed to be one of the pioneering studies in

SCM context, may contribute to a more empirically grounded discussion on the managerial challenges of using ARF and the research opportunities on ARF.

In fact, our paper fills the gap in the SCM literature by extending the domains of SCM theory from logistic flows, information flows to new aspects such as financial flows (Lee and Ng, 1997; Shunk et al., 2007). Based on the review of existing literature, there is a lack of research focus on the WCM in the supply chains (Gunasekaran and Kobu, 2007; Ketchen and Hult, 2007; Hofmann and Kotzab, 2010). In this paper, we focus on specific issue related to WCM of supply chain firms and try to identify the critical determinants of using the ARF.

It is important to note that it is one of the first empirical survey-based evidences on the relations between supply chain determinants and adoption behavior of ARF. As the supply chain financial empirical research is still at its preliminary stage, it deserves further theoretical and empirical exploration and discovery on some relevant SCF issues. However, based on our review of literature, most existing papers are case-based (Randall and Ii, 2009; Vliet et al., 2013; Wuttke et al., 2013a; Wuttke et al., 2013b; Silvestro and Lustrato, 2014) or survey-based with small set of data (More and Basu, 2013). What is more important, there is a scarcity of research on ARF related topics.

Last but not the least, we hope that this paper will have a guiding role to both SCM professionals and bankers in analyzing the ARF adoption behavior of supply chain firms. Especially when SCF is one of the promising businesses to banks, we hope to provide banks with critical insights needed to improve their customer acquisition and risk management practices since we have explained subtle differences in their financial clients' ARF adoption behavior from the integration of SCM and WCM perspectives.

THEORETICAL FOUNDATION

Working Capital Management & Cash-To-Cash Cycle

Working capital, which is the sum of the money available for day-to-day operations, represents operating liquidity available to an enterprise, and indicates whether an enterprise has adequate current assets to cover its current liability. Among the most important items of working capital are levels of inventory, accounts receivable and accounts payable (Hofmann and Kotzab, 2010). Generally speaking, it is believed that the better the enterprise manages the working capital, the less the enterprise needs to borrow.

Researches on WCM show that the successful companies usually effectively manage their working capitals in appropriate levels as they want to get better values for its

working capital without sacrificing the quality of product and services (Richards and Laughlin, 1980; Gentry et al., 1990). Since the aim of WCM is to balance between having adequate cash flows for operations and having productive use of resources, it is important for the enterprises to examine the cash-to-cash cycle (Farris II and Hutchison, 2002; Farris II and Hutchison, 2003), meaning that the length of time they take for money tied up in production, inventory, and sales to generate cash through sales to customers. Formula (1) illustrates the metric of cash-to-cash cycle by considering the length of time spent to sell inventory, the length of time needed to collect accounts receivable and the amount of time the company is afforded to pay its bills without incurring penalties (Randall and Ii, 2009; Hofmann and Kotzab, 2010).

Cash-to-Cash Cycle in Sales Stage = Days of Goods in Process &Finished Goods Inventory +Days of Receivables-Days of Deposit Received = (Finished Goods Inventory ($)/Cost of Goods Sold ($))*365+ [(Accounts Receivable ($)-Accounts Deposit Received ($))/Net Sales ($)]   (1)
         (Motivated by Farris II and Hutchison, 2002; Farris II and Hutchison, 2003)

To increase the amount of working capital at disposal, the enterprises, for the ordinary production-to-sales cycle, try to determine and maintain the level of inventory that is sufficient to meet demand and avoid stock-out but not more than necessary. Meanwhile, the enterprises (i.e. manufacturers) should forecast cash positions and maintain a target positive cash flow balance by minimizing all negative cash flows and reducing the cycle time to improve liquidity. The effectiveness of working capital can be improved if the enterprises can reduce average time they take to produce and sell inventory and the average time to collect receivable and to increase the average time to pay their suppliers. Through the better WCM, the companies can avoid the ineffective occupancy of working capitals to support positive cash balances throughout the operations (Enqvist et al., 2014; Hassani and Tavosi, 2014; Mehta, 2014).

In this paper, we attempt to investigate the collaborative patterns and behavior of supply chain firms to see how SCM influences the effectiveness of WCM, the needs for capital and the adoption behavior of ARF.

Supply Chain Management and Supply Chain Integration

Following the improvement and development of SCM theories (Chen and Paulraj, 2004), there are increasing amount of literature on identifying the collaborative behavior

on Supply Chain Integration (SCI) (Van der Vaart and Van Donk, 2008). Here, SCI refers to the degree to which the manufacturers strategically collaborate with business partners to manage operational flexibility and to respond to external events (Flynn et al., 2010). SCI generally comprises three dimensions: supplier integration, internal integration, customer integration. SCI involves resource planning, coordination, control to achieve synergetic efficiency and status of the supply chain (Chen et al., 2000; Flynn et al., 2010). It involves buyer-supplier interactions from order to payment and from relationship building to the tasks of enriching the information resources (Blois, 1983; Van der Vaart and Van Donk, 2008).

In the manufacturer-buyer relationship, SCI typically specializes in fair and reasonable payment and working capital optimization to make business more liquid and sustainable (Mitra and Singhal, 2008; Zhao et al., 2008; Lee and Rhee, 2011; Silvestro and Lustrato, 2014).

From the SCM perspective, SCI emphasizes resources planning and the alignment of business activities (including make and delivery) to promote value for money invested in daily operations (Supply Chain Council, 2002; Stefan, 2004). In this paper, we use "Manufacturing Cycle" to reflect the internal operational efficiency and use "Percentage of Delivered on Time" to reflect the performance on delivery (Carter and Hendrick, 1997; Lummus and Vokurka, 1999; Mitra and Singhal, 2008).

From the relationship management perspective, SCI focuses on the collaborative partnership between manufacturers and core firms. The process in which both parties collaborate to improve manufactures' selling costs and efficiency affects the manufacturers' effectiveness on managing working capital (e.g. account prepaid) (Morash and Clinton, 1998; Frohlich and Westbrook, 2001; Zhao et al., 2008). In this paper, we use "relationship strength" to reflect the collaborative relationship between manufacturers and buying core firms.

Last but not the least, SCI emphasizes informationization of supply chains to assist both parties in promoting and keeping track of cooperative behaviors. Generally speaking, the higher the level of informationization, the better is the synchronization of their supply chain, and more effective is the WCM and cost reduction (Auramo et al., 2005).

By integrating SCM theory with WCM, we hope to understand the adoption behavior of ARF based on the principles, as reflected in formula (1), that the effective allocation of resources and management of positive target cash flows of manufacturers rely greatly on various factors, including but not limited to occupancy of funds, payment methods, delivery on time, relationship strength, SC informationization and etc. In this paper, we attempt to develop a framework of ARF adoption behavior by considering the key factors

related to SCM and WCM.

HYPOTHESIS DEVELOPMENT

As discussed above, manufacturers that deploy the credit sales method will increase accounts receivable, which are the current assets made by sales and not immediately paid for by customers. The cost of carrying accounts receivable (e.g. opportunity cost, management cost and default cost) increases when the size and days of accounts receivable increase, and the manufacturers will suffer from poor liquidity if the conversion time of working capital to cash is excessively long (Oh, 1976). In the worst situation, the manufacturers may eventually go broke if the gap between profits and cash flows (i.e. cash flow gap) is overwhelming large, and if they cannot distinguish between high-risk and low-risk buyers (i.e. sales agencies).

In the presence of increasingly high capital pressure on companies, there is a sign of worsening relationship with buying core firms, which are often accounted for the shift of capital pressure. In order to maintain the stability of supply chain and the loyalty of manufacturers, more and more buying core firms are willing to help the suppliers acquire ARF from the financial institution in a more cost-efficient manner based on their credit's worthiness and history. In this increasingly popular scenario, the manufacturers in which the accounts receivable significantly occupy the funds are more likely to adopt the ARF.

In this paper, we will measure the occupancy of accounts receivable in term of the manufacturers' "average collection period" (M1) and "average amount of account receivable per case" (M2). Specifically, average collection period of account receivable refers to the average number of days between the date that a credit sale is made and the date that the money is received from the buying firms.

Therefore, we give the following hypothesis:

H_M: The occupancy of manufacturers' accounts receivable may positively influence the manufacturers' adoption of ARF.

As discussed earlier, the manufacturers take risks and bear costs to hold accounts receivable. For those powerful manufacturers, while they may delegate a longer due date to large buying firms for sales promotion, they may require the small and medium sized customers to pre-pay at certain percentages to mitigate potential default risks. According to the formula (1), as previously illustrated, the accounts prepayment method by which the buying firms use to pay invoices will reduce companies' capital pressure and improve the working capital turnover of manufacturers to various extents.

Since the capital pressure is perceived to be a driver of ARF adoption, the companies to which buying firms are required to pre-pay are more likely to adopt the ARF. In this paper, we use dummy variable for a given categorization of "the account prepayment method" (X1). If the buying firms are allowed to prepay certain percentage, we assign the value 1. Otherwise, we assign 0.

Thus, we give the following hypothesis:

H_{1a}: The account prepayment method (X1) by which the buying firms use to pay invoices will negatively directly affect the manufacturers' adoption of ARF (Y).

H_{1b}: The account prepayment method (X1) by which the buyers use to pay invoices will negatively indirectly affect the manufacturers' adoption of ARF (Y) through the mediation of occupancy of accounts receivable (M).

To fulfill the variety of requirements of buying firms, the manufacturers often emphasize the integration of procurement, production and sales in the production and operation level (Germain and Iyer, 2006) and rationalize the production based on actual needs of customer to improve production efficiency and reduce manufacturing cycle (Koufteros et al., 1998). In this paper, Manufacturing Cycle refers to the complete cycle of the process which involves the placing of sales order and the production of order items.

Specifically, the manufacturers will attempt to optimize the production system and reduce the manufacturing cycle time according to their sophistication level of production equipments and skills, as well as the requirements of sales order (Koufteros et al., 1998). Following the lean thinking, the manufacturers will strive hard to reduce production cost and manufacturing cycle (Hartley and Choi, 1996), and to reduce waste (e.g. excess inventory and capacity) (Abegglen and Stalk, 1985). When the manufacturing cycle is too long, the manufacturers' working capital will be occupied (Buzacott and Zhang, 2004), and the manufacturers' will be increasingly pressurized. Under this situation, manufacturers may become more willing to adopt ARF.

Therefore, we propose the following hypothesis:

H_{2a}: The manufacturing cycle time of manufacturers (X2) will positively influence the adoption of ARF(Y).

H_{2b}: The manufacturing cycle time of manufacturers (X2) will indirectly positively influence the adoption of ARF(Y) through the mediation of occupancy of accounts receivable (M).

Both manufacturers and buying firms emphasize the strategic fit between their

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business goals, business processes and practices in the development of the long-term strategic partnership. In such a case, they typically highlight Percentage of Delivered on Time (Hald and Ellegaard, 2011), reflecting how good the company is to deliver the products at the customer site by a specific date. From the buying firm's perspective, they want a very high ratio on timely delivery as they need to integrate manufactures' products into their own products, which are scheduled for their own production on a specific date. From the manufacturers' point of view, they may be involved with penalties or outright rejection if the required arrival date is missed. Since from the supply chain perspective, high percentage of delivered on time reflects operational efficiency of manufacturers (Carter and Hendrick, 1997; Tu et al., 2006), we assume that those having high percentage of delivered on time is more powerful, and have a stronger SCI with buying firms. It implies that manufacturers tend not to adopt ARF as they have achieved better SCI which may reduce the capital pressure arising from incoordination and poor operations.

Therefore, we propose:

H_{3a}: Percentage of Delivered on Time (X3) will negatively affect the adoption of ARF (Y).

H_{3b}: Percentage of Delivered on Time (X3) will negatively affect the adoption of ARF (Y) through the mediation of occupancy of working capital (M).

As previously mentioned, the buying firms emphasize the long-term stable relationships with manufacturers (Malone and Crowston, 1994). Partnership is essential in the supply chain and can be described in term of trust and information sharing (Beamish and Banks, 1987). As good partnership can handle differences and manage expectations more effectively, it is more likely that the manufacturers' transaction cost will be reduced through better communication (Dyer and Chu, 2003) and default risk evaluation (Aggarwal, 1997; Magretta, 1998). In such a case, manufacturers having stronger relationship strength with buying firms may be less likely to adopt ARF as external financing probably due to the availability of synergetic internal solutions to mitigate the WCM issues.

Therefore, we propose the following:

H_{4a}: The relationship strength (X4) will negatively influence the adoption of ARF (Y).

H_{4b}: The relationship strength (X4) will negatively influence the adoption of ARF (Y) through the mediation of occupancy of working capital (M).

SCI emphasizes the supply chain informationization (Frohlich and Westbrook, 2001),

which refers to the process of making the best use of real-time, automated information, derived knowledge and enabling technologies to enhance collaborative partnerships (Simatupang et al., 2002; Li and Lin, 2006). Specifically, on the premise of relationship management (Zhao et al., 2008), manufacturers having high degree of supply chain informationization can achieve better forecasting due to lower bull-whip effects (Rai et al., 2006), and realize higher level of supply chain performance through supply chain integration (Zhu et al., 2006). As such, we believe that higher level of supply chain informationization will reduce the occupancy of accounts receivable to improve the overall WCM (Lee and Whang, 2000). Due to reduced capital pressure, it is unlikely for manufacturers to adopt the ARF.

Thus, we give the following hypothesis:

H_{5a}: The degree of supply chain informationization (X5) negatively influences the adoption of ARF (Y).

H_{5b}: The degree of supply chain informationization (X5) negatively influences the adoption of ARF (Y) through the mediation of occupancy of working capital (M).

This paper focuses on the link between manufacturers and buying firms, and aims to analyze the influential factors of ARF behaviors (Y) by considering the occupancy of accounts receivable to working capital (M) as a mediating effect. Besides that, we consider the control variables of M and Y, which include company size (Giannetti et al., 2008), company corresponding industry (Smith, 1992; Blome and Schoenherr, 2011), the proportion of buying firms with credit period (to all firm clients), company's working capital positions (excluding accounts receivable). Figure 1 demonstrates the research framework.
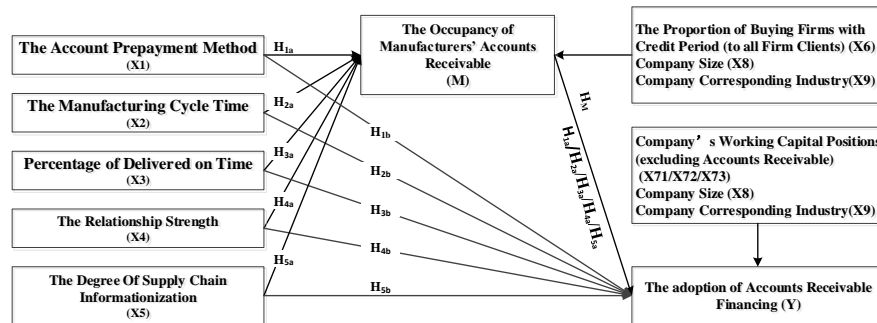

Figure 1 - Theoretical Framework

Acknowledgments

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