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THE FINANCIAL SUPPLY CHAIN MANAGEMENT: A NEW SOLUTION FOR SUPPLY CHAIN RESILIENCE

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Abstract
In the present article, the author aims to find solutions to optimize the supply chain for the cash flow – a flow of products reversed from the physical one and the two-ways flow of information. In the last 15-20 years, academics and practitioners were oriented towards increasing the speed, cost reduction on supply chain material’s flow, oriented towards 3RP (3 Resource Planning) logistics solutions and management solutions such as outsourcing or collaborative management. In terms of information flow, there has been a real revolution with the rise of the Internet and information technology standards introduced by the VICS (Voluntary Interindustry Commerce Standards), CSCMP (Council of Supply Chain Management Professionals), SCC (Supply Chain Council) și ECR Europe (Efficient Consumer Respons).

The objective of this paper is to identify new ways of working together on supply chain financial flows. Methods used are the documentation in the literature and the practices of transnational companies under recession. Results refer to the identification of new solutions such as reverse factoring. A comparative analysis regarding the european and national regulations gets us to the conclusion that Romania is still tributary to traditional commercial credit. We propose that the Collaborative management, as a modus vivendi in a globalized and super computerized world, must be included within all Romanian organizations life, within the Supply Chain, but also those which are 3PL (Third Part Logistics) and 4PL (Four Part Logistics) organizations, where not only information services are included, but also financial services (banks and specialized financial institutions).

Keywords: Financial supply chain management, logistic chain, working capital; supply chain finance; net working capital; factoring; reverse factoring.

JEL Classification: M19, M11, G32

Introduction
Supply Chain Management (SCM, 2006) as defined by the Council of Supply Chain Management Professionals (CSCMP) “encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. It also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence,
Supply chain management integrates supply and demand management within and across companies. 

Supply Chain Management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the logistics management activities noted above, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance, and information technology.” (CSCMP in Vitasek, 2006, p. 139).

Today, supply-chain management philosophy highlights that the objective of any supply chain is to maximize the total value generated by members for their companies and clients. Supply chain management is based on the idea of cooperation between successive levels and external integration (Balan, 2008).

1. Financial Supply Chain Management (FSCM)

1.1. Overview

Despite the past years’ crisis, the industry has continued to innovate in financial supply chain management to enhance value for trading counterparties and improve efficiency.

A new trend that emerged in the recent years is to develop financial services for supply chain management, together with information technology services and consulting are part of Four Part Logistics Providers (4PL), separated for transport services (3PL) warehousing and storage (RDC - Retail Distribution Center).

It is noticed a phenomenon of outsourcing of services to those companies who claim big expenses with additional services, appealing for them to other companies, which have specialized in providing solutions, including complete solutions (Schileru, 2008).

Outsourcing various business activities (including logistics) enables it:

- To focus on the competition;
- To make financial gains by transforming fixed costs into variable costs;
- To release a series of financial assets;
- To transfer some of the risks associated with their outsourced activities;
- To have more flexibility on logistics performance and, especially, to control it (Vasiliu, 2008).

Banks recognize that the global tightening of credit represents both a short-term challenge and a medium term business opportunity. Although the majority of cross-border opened account trade is conducted corporate-to-corporate, evidence suggests that a significant percentage will migrate to a bank-assisted model over the coming years. Corporates and, in some countries, regulators have voiced their demand for banks to provide greater innovation through bank-intermediated supply chain solutions (Casterman, 2010).

There are different definitions of the term financial supply chain, which appeared for the first time at the beginning of 2000. According to the research company Killen & Associates (2001), the financial supply chain “parallels the physical or materials supply chain and represents all transaction activities related to the flow of cash from the customer’s initial order through reconciliation and payment to the seller.” (Weiss, 2012, pp. 1-5) The Aberdeen Group, a research company, defines the financial supply chain “a range of B-to-B trade-related intra- and inter-companies financial transaction-based functions and processes
that begin before buyers and suppliers establish contact and proceed beyond the settlement process.” The two definitions emphasize different topics. Killen’s focuses on the parallelism between the physical and financial supply chain, and it stresses out the section of the cash flow cycle that while the Aberdeen Group’s definition focuses on the collaborative nature of financial supply chain management and reveals that the financial value chain is not limited to the inner walls of a company but includes communication and cooperation with business partners (Weiss, 2012).

The short definition that includes three aspects is the following “Financial Supply Chain Management (FSCM) consists of the holistic and comprehensive activities of planning and controlling all financial processes, which are relevant within a company and for communication with other enterprises”.

The financial supply chain is different from the physical supply chain as it deals with the flow of cash instead of goods, being a flow with an opposite direction.

The order-to-cash process includes, from the perspective of a supplier (or creditor), the following business process steps: 1. Creditworthiness check; 2. Invoice creation; 3. Cash forecast; 4. Financing of working capital; 5. Processing of dispute cases; 6. Cash collection; 7. Settlement and payment; 8. Account reconciliation.

From the perspective of a customer (or debtor), the purchase-to-pay process consists of the following business processes: 1. Procurement; 2. Cash forecast; 3. Financing of working capital; 4. Receipt of invoices; 5. Resolution of discrepancies or exceptions; 6. Invoice approval; 7. Settlement and payment; 8. Account reconciliation (Weiss, 2012).

1.2. Cash Flow Cycle of Financial Supply Chain Management

There are various key performance indicators relevant for the measurement of the financial supply chain management. One key metric is the cash flow cycle, which defines the period from delivery until the cash collection of receivables from customers. It is the time period required for the company to receive the invested funds back in the form of cash. The cash flow cycle (figure no. 1) can be divided into the operating cycle—which is the time period between delivery by suppliers and the actual cash collection of receivables, and the cash flow cycle—which is the time period between the cash payment for inventory and the cash collection of receivables.

Figure no. 1: The cash flow cycle of FSCM

The longer the cash flow cycle, the greater is the working capital requirement of a company, which means that a reduction of the cash flow cycle will immediately free up liquidity.

Within the cash flow cycle, we can differentiate the following parameters, delimited in fig. nr. 1: (Weiss, 2012)

- **Days in inventory**: This is the length of time between the delivery of the goods and the invoice from the supplier, and the sale of the goods and the invoice to the customer. It describes the average number of days the goods of a company remain in inventory before being sold. This metric is the focus for all activities around classical supply chain management (inbound logistics and inventory management).

- **Days in payables**: This is the length of time between delivery of the goods and the invoice from the supplier, and the actual payment for the inventory. This figure describes the average time it takes to pay a supplier. The parameter considers the outstanding receivables of a company, and is an important metric for debtors concentrating on their efforts to optimize the purchase-to-pay cycle.

- **Days sales outstanding (DSO)**: This is the length of time between the sale of the goods and the invoice to the customer, and the actual payment date of the customer. This metric measures the average number of days companies need to collect revenue after a sale has been made. A high DSO number means that an enterprise is selling to its customers on credit and taking longer to collect money.

- **Days in receivables**: This is the length of time between the sale of goods and the invoice, and indicates the average time, in days, while receivables are outstanding. Days in receivables can also be called best possible DSO, since the company would collect all receivables before the due date.

Within the cash flow cycle there is potential to reduce both days in inventory and days sales outstanding.

Days in payables can be reduced but should be monitored carefully to avoid putting supplies at risk. Days in receivables can be reduced by optimizing cash collection.

One of the key objectives of financial supply chain management is to optimize the working capital by reducing, for instance, outstanding receivables (Weiss, 2012).

As FSCM is a rather new approach in logistics and only recently recognized in literature.

2. Supply Chain Finance

As a result of the current situation where pressure on supply chains is mounting because of the economic downturn, but where refinements to the physical supply chain no longer have a significant impact, interest has been mounting in Supply Chain Finance (SCF) techniques to ease the burden. Banks, in particular who are keen to lend but are very reluctant to damage their risk profiles further, are exploring imaginative methods of extending credit secured against robust assets, such as invoice debt.

According to the Aberdeen Group, the definition of Supply Chain Finance is: “A combination of Trade Financing provided by a financial institution, a third-party vendor, or
a corporation itself, and a technology platform that unites trading partners and financial institutions electronically and provides the financing triggers based on the occurrence of one or several supply chain events.” (cited in Supply Chain Finance. A third report from Demica: Strengthening the Links, Issue no. 10, Demica, April 2009).

Supply Chain Finance is generally viewed as the province of a commercial bank’s lending arm. Relationship banks offer a working capital management facility for their large corporate clients (product/service buyers, “Buyers”), while at the same time providing prompt payment facilities for their suppliers (“Suppliers”).

This is essentially the same as a closed user group factoring arrangement, the main difference being that the facility is arranged with the Buyer, who then introduces the service to its Suppliers, to the benefit of both parties. In industries where efficiencies in the physical supply chain have been refined to the utmost level, attention has now moved to the financial supply chain. The result is abundant activity around vendor finance and supplier finance that allow Buyers to ease payment terms while also ensuring that their Suppliers’ cash flow is improved, thus reducing or avoiding instability in the supply chain.

For banks, FSCM as a concept was initially a marketing umbrella to repackaging such traditional products as trade, insurance, payments and cash management. More recently, banks have reviewed traditional trade and cash management services and identified those elements of the value proposition that could be developed to better serve their customers’ physical and financial supply chain. In this context, banks tend to define FSCM services in terms of five interrelated groups: 1. Payments and cash management; 2. Working capital management (WCM) and supply chain finance; 3. Risk mitigation; 4. Process improvement; 5. Shared Services (BPO); 6. Visibility control. (The 2007 Guide to Financial Supply Chain Management, HSBC) (figure no. 2).

**Figure no. 2: Key elements of FSCM**

Source: The 2007 guide to Financial Supply Chain Management, HSBC

Introduced in the 1990s, the first model of SCF combined domestic trade finance with supply chain management through an innovative invoice financing arrangement known as “reverse factoring,” a three-way agreement by which the bank (or “factor”) purchases the...
receivables of the supplier with legal recourse to the buyer. In this earliest model, reverse factoring was purely a domestic service offered within select industries, especially the automotive sector. A large, investment-grade company could extend its days payables outstanding while allowing its suppliers to reduce their days sales outstanding at a favourable rate. Thus, reverse factoring is a form of credit arbitrage: by relying on the stronger credit rating of the buyer, SME (Small and Medium Enterprises) suppliers get liquidity at better terms.

The second model of SCF emerged as many large companies began sourcing their raw materials from SMEs around the world. The key enabler here was the development of technology platforms with two innovative features. First, these platforms connected all counterparties around the world, and second, they made it possible for multiple credit providers to connect and compete on financing, with the expectation that lower cost receivables financing would attract more suppliers. Despite these innovations, participation in SCF has never fulfilled expectations, due to a number of inhibiting factors. First, legal and accounting standards in many countries do not recognize e-invoices and other electronic documents as legally binding. Second, the low cost of capital in the mid-2000s virtually eliminated the marginal advantage of credit arbitrage between large corporate buyers and SME suppliers.

Third, linking suppliers with banks’ proprietary platforms proved to be cumbersome and expensive. While the second model of SCF reached a modest level of success in previous years, the failure to achieve critical mass has prompted many companies to abandon SCF programs. Ultimately, the third model will integrate the pieces of the financial supply chain from end to end, fully automating the buyers’ procure-to-pay and suppliers’ order-to-cash cycles. This new level of integration will support event-triggered financial services along the physical supply chain (e.g., purchase order tracking, invoice matching services, e-invoicing, open account payments, import/export financing, reverse factoring) and afford full transparency into each transaction. The integration of procurement, invoicing and financing within a single platform represents the full convergence of cash management and trade finance. (Hurtrez, Gesuasive Salvadori, 2010)

Working together (Win-Win-Win) brings better liquidity and a more efficient capital allocation.

SCF is a rare example of a tripartite value proposition for banks, buyers and suppliers. First, it helps banks optimize use of capital by reducing the consumption of risk-weighted assets, as counterparty risk shifts to larger buyers with a better risk profile. Second, the credit differential among investment grade buyers and their SME suppliers is wide enough in the current funding market to make the credit arbitrage of reverse factoring an attractive way to improve liquidity for both buyers and suppliers. Third, the more efficient, automated credit mechanism of SCF strengthens each link of the supply chain, thus decreasing buyers’ operations risk. Finally, elimination of paper processing can reduce processing times of 30 to 60 days to approximately 10 days, enabling suppliers to offer better discounts for early payment.
3. Working Capital Management

3.1. Working Capital Management and Commercial Lending

Working capital management in a multinational enterprise (MNE) requires managing current assets (cash balances, accounts receivable, and inventory) and current liabilities (accounts payable and short-term debt) when faced with political, foreign exchange, tax, and liquidity constraints (Halpern, 1998).

The overall goal is to reduce funds tied up in working capital while simultaneously providing sufficient funding and liquidity for the conduct of global business. Working capital management should enhance return on assets and return on equity and should also improve efficiency ratios and other performance measures.

The operating cycle of a business generates funding needs, cash inflows and outflows (the cash conversion cycle) and foreign exchange rate and credit risks. The funding needs generated by the operating cycle of the firm constitute working capital.

The cash conversion cycle, a subcomponent of the operating cycle (working capital cycle), is that period of time extending between cash outflow for purchased inputs and materials and cash inflow from cash settlement. This is decomposed into five different periods (each with business, accounting, and potential cash flow implications): Quotation period, Input sourcing period, Inventory period, Accounts payable period, Accounts receivable period.

If Cascade Mexico’s business continues to expand, it will continually add to inventories and accounts payable (A/P) in order to fill increased sales in the form of accounts receivable (A/R). (figure no. 3)

![Operating Cycle Diagram for Cascade Mexico](image-url)
These components make up net working capital (NWC):

\[ \text{NWC} = (\text{A/R} + \text{inventory}) - (\text{A/P}) \]

The previous exhibit illustrates one of the key managerial decisions for any subsidiary: A/P should be paid off early, taking discounts offered by suppliers; The alternate form of financing for NWC balances is short-term debt.

A common method of benchmarking financial management practice is to calculate the NWC of the firm on a “days sales” basis. An analysis of this metric in a global context shows that US firms have a typical days sales of 29, while the European group has a day’s sales of 75. Clearly, European-based (technology firms in this example) are carrying a significantly higher level of net working capital in their financial structures. The MNE itself poses some unique challenges in the management of working capital. Many multinationals manufacture goods in a few specific countries and then ship the intermediate products to other facilities globally for completion and distribution. The payables, receivables, and inventory levels of the various units are a combination of intra-firm and inter-firm. The varying business practices observed globally regarding payment terms – both days and discounts – create severe mismatches in some cases.

Net Working Capital (NWC) is the net investment required of the firm to support on-going sales. NWC components typically grow as the firm buys inputs, produces product, and sells finished goods (NWC is not the same Current assets and Current liabilities) (Pearson Addison-Wesley, 2004).

### 3.2. Essential Indicators of FSCM

- **Days Inventory Outstanding**: \( \text{DIO} = \frac{\text{Year-end inventory plus LIFO reserve}}{\text{one day of average revenue}} \). A decrease is an improvement, an increase a deterioration.

- **Days Payables Outstanding**: \( \text{DPO} = \frac{\text{Year-end trade payables}}{\text{one day of average revenue}} \). An increase in DPO is an improvement, a decrease a deterioration. For purposes of the survey, payables exclude accrued expenses.

- **Days Sales Outstanding**: \( \text{DSO} = \frac{\text{Year-end trade receivables net of allowance for doubtful accounts, plus financial receivables}}{\text{one day of average revenue}} \). A decrease in DSO represents an improvement, an increase a deterioration.

- **Days Working Capital**: \( \text{DWC} = \frac{\text{Year-end net working capital (trade receivables plus inventory, minus AP)}}{\text{one day of average revenue}} \). The lower the number of days is, the better. The percentage change is marked N/M (not meaningful) if DWC moved from a positive to a negative number or vice versa (Pearson Addison-Wesley, 2004).

### 4. A new financial solution: Factoring and Reverse Factoring vs. Commercial Credit

Normal financial collaboration (figure no. 4) and between supplier-manufacturer-retailer is made by commercial credit. Factoring is a new comprehensive finance business including
commerce financing, credit survey, receivables administration and credit risk guarantee. It refers to a finance business in which the seller sells his receivables to the factor who will press for the receivables. We can divide the factoring business into domestic factoring and international factoring according to whether the supplier and the buyer being in the same country or territory. In international factoring, the domestic factor asks the factor in the corresponding country to convey the credit of the buyer and give according to the order between the exporter and overseas buyer through international factoring organization.

Figure no. 4: Typical supply chain financing

The domestic factor buys the receivables of the seller, and granting financing to the seller in advance in his bound, and then press for the receivables. As the domestic enterprise credit system has not been built, it would be difficult to develop domestic factoring business, next we will discuss the international factoring business with the supplier in China for example and the buyer abroad (Li, Wei).

4.1. Financing from Cash in advance.

This means companies may collect cash in advance from the buyers to create a short term cash inflow/financing. This method is based on the companies’ commercial credits. Funding cost is lower. Usually it’s adopted in the long production cycle, higher selling price, highly demanded products. For instance, real estate developer often requires the resident/buyer to pay a certain percentage of the total selling amount in advance, so as to borrow money from the buyers to partially release the funding pressure. But this method is seldom applied by SMEs on the supply chain.

4.2. Logistical warehousing financing.

This means companies pledge the inventories or the products in transit to the financial institutions to generate financing. At present, logistical warehousing financing could be divided into two categories. One is vertical credit-authorizing model. Commercial banks analyze the logistic companies business performances and grant credit facilities to those logistic companies. Logistic companies have to be responsible for the credit administration and risk control. Under this model, commercial banks may reduce their credit operating costs and transfer out the credit risks. The other one is inventories financing model. Commercial banks cooperate with logistic companies and jointly provide inventories financing to the companies. The banks must provide special service platform and management account to inventories financing, as well the credit risk evaluating abilities. Logistic companies provide logistical and information support to companies.
4.3. Account receivables financing.
This means to obtain financing from financial institutions against account receivables, including two methods: a) Pledge the account receivables. That is the Borrower pledges the account receivables to the bank to get financing in advance, and repay the bank once it receives the payments; b) Factoring. That is packing the account receivables to commercial banks or factoring agents to get financing and the borrower, meanwhile, give up the reimbursement rights.

While it seems firms generally adhere to industry norms, there is evidence they vary credit terms from customer to customer (How Working Capital Works, The 2011 Working Capital Scorecard – CFO, July 2011).

4.4. The win-win approach
The win-win approach in particular has received much attention at recent finance and academic conferences. Going beyond the simple adaptation of payment terms, finance professionals have combined financial insights with electronic payment platforms and thus created reverse factoring solutions. Reverse factoring is a resilience solution (Kotler, Ph., Caslione, J., 2009) of a supply chain that can head off the risk of disruption in the collaboration of informational flows and physical movement of the products, because of some financial problems – the financial flow. As the name reveals, reverse factoring solutions are based on factoring – a transaction in which suppliers sell receivables to factors for immediate cash (Seifert, 2011). Because the receivables are sold rather than pledged, traditional factoring is different from borrowing – there are no liabilities on the suppliers’ balance sheet. Typically, suppliers sell receivables from more than one buyer. Thus, factors have to evaluate buyer portfolios before entering an agreement (figure no. 5).

![Figure no. 5: Going into reverse](source: Seifert and Seifert, 2010)
This has made factoring an expensive source of finance in emerging markets. A lack of historic credit information or credit bureau, as well as fraud and weak legal environments, have meant high operating costs.

Reverse factoring, however, is different in three important aspects (Seifert, 2011). First, since the technique is buyer centric, factors do not have to evaluate heterogeneous buyer portfolios and can charge lower fees. Second, since these buyers are usually investment grade companies, factors carry less risk and can charge lower interest rates. Third, as the buyers participate, factors obtain better information and can release funds earlier. As a process, reverse factoring is slightly more complicated than traditional factoring. Bank X’s process, for example, involves seven steps. First, the buyer sends a purchase order to the supplier and notifies Bank X. Second, the supplier delivers and presents documents to Bank X. Third, Bank X checks the documents and notifies the buyer. Fourth, the buyer approves or rejects. Fifth, Bank X notifies the supplier of the buyer’s acceptance. Sixth, if the supplier requests early payment, Bank X credits the supplier’s account. Finally, when the invoice is due, Bank X debits the buyer’s account (figure no. 5).

5. Good Practices in Romania and Community acquis

The Directive 2000/35/EC was transposed by the Government Emergency Ordinance regarding measures to combat late payment obligations resulting from the execution of commercial contracts, adopted in 24 October 2007.

The directive adopted by UE in 24 January 2011, replacing the Directive 2000/35/EC mentions that, if the payment due date or time is not set in the contract, the creditor is entitled to charge the interest on late payments after 30 calendar days from the date of invoice or an equivalent request for payment. As a general rule for businesses, the payment deadline specified in the contract should not exceed 60 days.

According to the document, in case of public organizations or public institutions that provide medical services, for payment terms can be extended by 60 days. The Directive also provides compensation for recovery costs, represented by a fixed amount of 40 Euros; the creditor is entitled to obtain from the debtor as the minimum compensation, without being necessary a notice.

Conclusions

Given the attractive benefits and clear key success factors, we recommend executives take a closer look at reverse factoring. It may not solve all liquidity issues that companies face when credit is tight. But it seems a sustainable approach to reducing working capital in the long run. We suggest three steps:

- Clarify organizational responsibilities. Determine who sets and who monitors payments and decide how much these activities should be centralized;
- Define the strategy. Decide between the single and the portfolio approach and, as the case may be, detail each strategy (payment terms, negotiation priorities, tools);
- Run a pilot. Select a country/region and subsidiary, mobilize a team, and measure the improvement (baselines and performance metrics).

Key concepts in setting upstream propose to work with a generic process model that could be used to illustrate the entire supply chain, including type 4PL organizations (figure no. 6). Another level was considering the 3PL (Third Part Logistics) Three-Gether Working philosophy (Supply Chain Management for efficient consumer response is also for suppliers of ingredients, raw materials and packaging) (ECR Europe, 1999).

![Figure no. 6: Working All Together (WAT) for Supply Chain Excellence](image)

Given the current crisis and recession (chaoticism), it is necessary to rethink the collaborative management directed only to satisfy the participants at the chain, the end customer, in terms of information flows that support the transfer of logistics from raw materials to final product for the shopper. This, by taking into account the financial flows of these actors (financial organizations, such as banks, factoring financial institutions, insurance companies, etc.) and introducing in a new model the financial players and the approach of financial supply chain management - Working All-Together (WAT).

In crisis situations it is recommended to reschedule of invoice payment and an alliance between the two organizations. It is more difficult for an organization to sell the credit to a recovering firm. Also, recovering the debts can be easily made by negotiating. The measures against firms with debts also consider the cash flow of the company requesting the payment and the one of the paying company. The way the rescheduling is made depends on the invoice value and how much the paying company represents from the business of the other company. If the company in debt is an important client, buying 15-20% from the products, it is more necessary to rescheduling the payment (Popa, 1999).

I identified new solutions that are required in addition to commercial credit and factoring: reverse factoring. The comparative analysis with Romania, in the European and Romanian regulations, it is found that Romania is still tributary to traditional commercial credit.

We appreciate that the collaborative management approach – supply chain management – must be extended from the physical exchange of prime materials – finished goods and from...
the electronic transfer of information and the flow of the involved parts and the banks and institutions involved.

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