

Supply Chain, Financial Management and Bloomberg Terminals

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ABSTRACT

In this paper, we first identify a number of supply chain activities that require financial knowledge for value creating decision-making. We then recommend a set of financial concepts and techniques for supply chain professionals. In addition, we propose the use of Bloomberg terminals, with their extensive financial data, functions and analytical tools, as a solution for supply chain professionals to analyze the financial aspect of their decisions in an efficient way. In the end, we discuss the advantages and limitations of using Bloomberg terminals in financial management for supply chain professionals based on the authors experience in teaching with Bloomberg Terminals.

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1. Introduction

In the last several decades, the management of supply chain has been increasingly recognized as a strategic activity in the business world (Bechtel & Jayaram, 1997; Hult et al., 2007; Sindi & Roe, 2017). The domain of supply chain management expanded from an emphasis on downstream activities to an end-to-end focus, given the rising international cooperation and competition, vertical disintegration, and worldwide sourcing (Trent, 2015). Successful management of the supply chain activities and processes not only tie to the financial systems, objectives and performance of the firm, but also affect a firm's competitive advantage. As a result, recently there was a call for supply chain professionals to develop financial knowledge in order to better manage supply chain activities (Hofmann & Johnson, 2016; Leon, 2016; Trent, 2015).

Compared to finance, an academic discipline with an extensive body of knowledge, supply chain management is much less mature as a discipline (Trent, 2015.) There is a scarcity in the literature on the topics of specific financial knowledge, techniques, and tools needed for the supply chain professionals. In this study, we attempt to partially fill this void. We first review the existing literature in finance and supply chain management to identify the financial concepts and knowledge needed by supply chain professionals and managers. We then propose a sequential framework of specific financial concepts in the context of supply chain management. There has been a stream of research on using Bloomberg in finance and economics teaching and training (Lei & Li, 2013; Scott, 2010; Sharma, 2015). Following this trend, we introduce Bloomberg terminals as an information and analysis system that enhances the training in financial concepts and facilitates the financial analysis experience.

The rest of this paper is organized in the following sections. First, we review the existing literature in supply chain management and its relation with finance, and highlight why supply chain professionals and managers should develop financial knowledge. Next, we describe the framework of financial concepts needed in the context of supply chain management, with examples of how Bloomberg terminals can be embedded in this framework. In the third section, we discuss the advantages and limitations of using Bloomberg terminals in helping supply chain professionals and managers develop financial competency. The paper concludes with a review of the study.

2. Supply Chain Management and Finance

Supply chain management (SCM) can be defined in several different ways. Some researchers regard SCM as a management philosophy that seeks synchronization and convergence of intrafirm and interfirm operational and strategic capabilities into a unified, compelling marketplace force (Ross, 1998, 2011). Others treat SCM as a broad domain containing many activities such as purchasing and materials management, demand and supply planning, transportation, distribution, material handling, receiving and inventory management (Trent, 2015). Mentzer et al. (2001) summarize various SCM activities into the following categories:

- Integrated behavior to incorporate customers and suppliers
- Mutually sharing information among supply chain members for planning and monitoring processes
- Mutually sharing risks and rewards for long-term focus and cooperation among the supply chain members
- Cooperation through complementary and coordinated activities across the supply chain members
- The same goal and the same focus on serving customers by all the members of the supply chain
- Integration of processes from sourcing, to manufacturing, and to distribution across the supply chain
- Partners to build and maintain long-term relationships

Two theoretical lenses have been applied in assessing the financial impact of SCM initiatives (Dong et al. 2009). The first is the resource-based view that attributes improvement in firm performance to valuable resources or resource bundles (Barney, 1991). In the context of supply chain, such improvements stem from resource synergy along the supply chain, such as synchronized supply, production, and delivery. Such an integration across separate stages of a supply chain allows each supply chain partner to focus on its own operation and eliminate the duplicate resources, thus increasing resource utilization and decreasing operational costs (Dong et al., 2009). Studies in SCM have found that increased revenue generation and cost reduction can be achieved through supply chain integration (Dong et al., 2009; Li et al., 2006; Mukhopadhyay & Kekre, 2002). The second theoretical lens is transaction cost economics that attributes improvement in firm performance to efficient coordination among supply chain partners. Zhu & Kraemer (2005) found digitally enabled integration capability can substantially

improve transactional efficiencies through increased information sharing and communications capabilities. This view is also reflected in a framework of SCM proposed by Chen & Paulraj (2004) and related work done by Ross (2011).

With the changing environment of the business world and the evolution of the SCM, there is an increased need for the SCM professional to acquire financial knowledge (Leon, 2016). In particular, SCM practitioners need financial knowledge for two purposes. First, financial concepts and indicators are frequently used in business communications about the firm performance and valuation. For SCM professionals to understand the business environment and speak the language of business, they must have a working knowledge of finance (Trent, 2015). Second, many operating decisions in SCM, such as supplier evaluation and development, inventory management, planning and forecasting, will have significant impact on a firm's financial performance, such as working capital, gross margin, cash flow, and return on investment metrics. SCM professionals should employ the sophisticated body of knowledge, tools, and techniques in finance to better analyze and evaluate different options for the best decision (Trent, 2015). In the next section, we propose a framework of financial concepts, techniques, and tools that help SCM professionals develop a working knowledge of finance.

3. Financial Knowledge Needed by SCM Professionals

In view of the current business environment, which is characterized by global cooperation and competition, technology-enabled business innovations, shortened product life cycle, we identify the following financial concepts that are a minimum necessary for SCM professionals and managers.

- Economic environment of the firm and financial markets
- Financial statements, ratio analysis and performance measurement
- Time-value of money
- Management of working capital
- International aspects of finance

In the following, we provide more details about how these financial concepts are related to SCM activities, financial techniques that should be applied in SCM decision making, and functions available in Bloomberg terminals to facilitate the learning.

Economic environment of the firm and financial markets

The limited literature on financial management in SCM often neglects the introduction of general macroeconomics and general financial markets concepts that define the business environment of the firm. The prerequisite knowledge, such as economic indicators (e.g., GDP, inflation, PMI, consumer confidence), financial markets (e.g. money markets, equities and fixed-income), and international trade, is necessary for SCM professionals to better understand specific financial concepts and techniques. This is especially important for many SCM professionals who have little formal training in economics and finance as it represents the foundation on which financial concepts were built.

Bloomberg Market Concepts (BMC) is an online training program available through Bloomberg terminals. It provides basic concepts of economics, currencies, fixed income and equity valuation. The online training is composed of short videos across the four modules (economic indicators, currencies, equities, and fixed-income), allowing users, on their own pace, to familiarize themselves with the interface of Bloomberg terminal and to acquire a basic understanding of economics, financial markets and financial instruments. The videos are embedded with short quiz questions to help assess the understanding of the concepts. By completing BMC, the SCM professionals would obtain a BMC certificate attesting their proficiency in the topics.

Financial statements, ratio analysis and performance measurement

Every activity completed in a supply chain ends up somewhere on a financial statement (Trent, 2015). Therefore, SCM professionals should have a working knowledge of three critical financial documents: the balance sheet, the income statement, and the statement of cash flow. In particular, the terms used in these financial statements should be clear to SCM professionals, preferably through real world examples. Financial ratios reflecting the big categories of liquidity, activity, financing and performance are crucial for an understanding of the firm health. Bloomberg terminals contain extensive financial data, including current and historical financial statements, and the various financial ratios. Users can retrieve financial data of public companies from Bloomberg terminals to analyze their statements and to various ratios. A frequently used function in Bloomberg terminal for this purpose is Financial Analysis (FA). Figure 1 is a screenshot of this function that displays key financial data and ratios of Panasonic Corporation.

12 Months Ending	FY 2013	FY 2014	FY 2015	FY 2016	Current/LTM	FY 2017 Est	FY 2018 Est
03/31/2013	03/31/2014	03/31/2015	03/31/2016	12/31/2016	03/31/2017	03/31/2018	
Market Capitalization	1,511.8	2,711.5	3,644.9	2,398.7	3,250.3		
- Cash & Equivalents	498.0	592.5	1,298.9	1,014.4	1,146.3		
+ Preferred & Other	40.2	38.3	169.3	149.3	146.6		
+ Total Debt	1,143.4	642.1	972.9	725.9	1,124.8		
Enterprise Value	2,197.5	2,799.4	3,488.2	2,259.5	3,375.4		
Revenue, Adj	7,303.0	7,736.5	7,715.0	7,553.7	7,232.4	7,335.5	7,626.8
Growth % YoY	-6.9	5.9	-0.3	-2.1	-5.7	-2.9	4.0
Gross Profit, Adj	1,883.2	2,097.7	2,187.8	2,213.7	2,114.6	2,009.9	2,130.9
Margin %	25.8	27.1	28.4	29.3	29.2	27.4	27.9
EBITDA, Adj	500.3	636.2	668.4	690.5	600.0	565.9	633.6
Margin %	6.9	8.2	8.7	9.1	8.3	7.7	8.3
Net Income, Adj	-384.1	217.0	236.9	244.3	258.6	157.8	194.1
Margin %	-5.3	2.8	3.1	3.2	3.6	2.2	2.5
EPS, Adj	-166.15	93.87	102.48	105.41	111.42	68.21	83.61
Growth % YoY	-50.9	-	9.2	2.9	-0.7	-35.3	22.6
Cash from Operations	338.8	582.0	491.5	398.7	287.7		
Capital Expenditures	-320.2	-201.7	-224.2	-241.8	-269.5	-311.6	-310.9
Free Cash Flow	18.6	380.2	267.3	156.8	18.3	68.8	105.0

Figure 1
Financial data retrieved by FA function in Bloomberg terminal

For supply chain managers, strategic sourcing involves supplier evaluation and development. One specific activity in this area is to assess the financial health of the existing and potential suppliers. Bloomberg terminals have two advanced functions for this purpose. The first function is called Supply Chain Analysis (SPLC). As shown in the screenshot (Figure 2), this function can help the user explore major suppliers, customers and competitors of public companies, sorted by various criteria. Once a supplier is identified, FA function can be used to retrieve its financial data for analysis and evaluation.

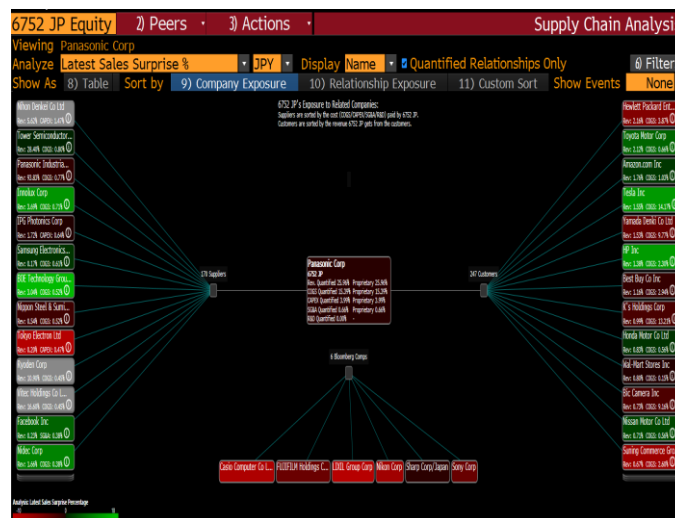


Figure 2
SPLC function in Bloomberg Terminal

Another function related to supplier evaluation is Altman's Z-Score, which is essentially a weighted average of several financial ratios meant to assess the probability of a firm going bankrupt (see Altman, 1968.) Suppliers going bankrupt would disrupt the supply chain and potentially cause great loss to the buying company. In Bloomberg terminal, the Z-Score can be retrieved through the function AZS.

Time-value of money

Supply chain managers need financial techniques to evaluate capital projects such as acquiring new equipment for warehouse management, or installing a software for planning and forecasting. In order to evaluate the viability of such projects, financial techniques that focus on time value of money (TVM) must be applied. The typical techniques include Net Present Value (NPV) and Internal Rate of Return (IRR). In NPV, future cash flow associated with the supply chain initiatives are discounted at a hurdle rate, which is equivalent to the cost to obtain capital through equity or debt. In business finance, this rate is called weighted average cost of capital (WACC) and is available in Bloomberg terminal under WACC(see Figure 3.) When the NPV is positive, the project will add value to the corporation. IRR represents a rate that is unique to a project and when it is higher than the WACC, it indicates a project that adds value.

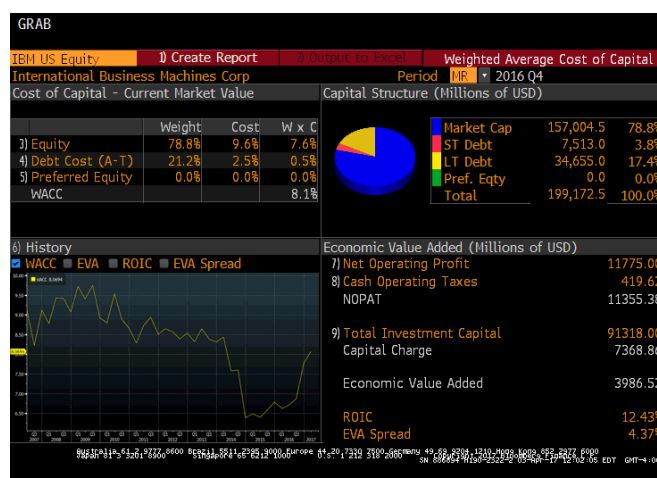


Figure 3

Cost of Capital (WACC) information platform in Bloomberg Terminal

In addition, in Bloomberg terminals, functions related to bonds can provide real financial data about the cost of capital through debt. For instance, yield curves (YCRV) can show the historical trend of bond yield over a period, while bond yield forecast (BYFC) provides the estimated bond yield in the near future based on financial analysts' consensus. The cost of debt can be found with functions like YAS while the cost of equity is available in several

Bloomberg functions for example DDM, which also value the equity of a company through dividend discount models (DDM.). Figure 4 shows examples for both YAS and DDM.

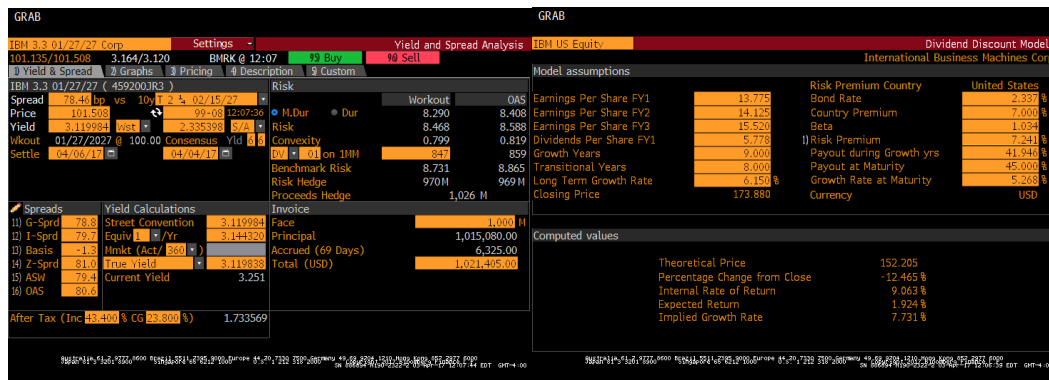


Figure 4
Cost of Debt and Equity in Bloomberg Terminal with YAS and DDM

Management of working capital

While the most common approach to managing working capital (difference between current assets and current liabilities) is to accelerate receivables and delaying payables, supply chain professionals can contribute to the management of working capital through optimized inventory management. To understand the impact of various inventory management strategies on the working capital, and on other financial indicators of the firm, supply chain managers can employ a financial technique named DuPont Model analysis. The DuPont Model essentially decomposes a firm's return on equity (ROE) into profitability (measured by profit margin), asset efficiency (measured by asset turnover), and financial leverage, the proportion of debt in the capitalization of a firm (measured by the equity multiplier). Inventory as a component of current assets plays a role in asset turnover. Using this technique, supply chain managers can determine the relative importance of inventory management on the level of working capital, and conduct what-if analysis based on different inventory management scenarios.

In Bloomberg terminals, a DuPont Model analysis can be conducted through a sub-function of Financial Analysis. The specific function is a ratio analysis called ROE Decomposition that show the multi-year data of component ratios in DuPont Model, which allows people to see the trends of profitability, asset efficiency, and financial leverage. In addition, Bloomberg terminals allow users to export the data into Excel spreadsheets for further analysis and what-if simulations. Figure 5 is an example of an in-depth DuPont Model analysis, with financial

data imported from Bloomberg terminal. It examines detailed items that affect the company's profitability and asset efficiency, two important objectives the need be considered by supply chain managers.

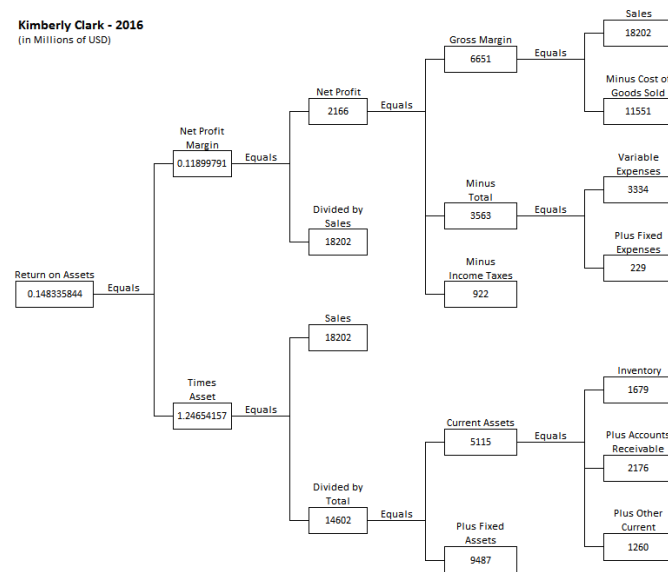


Figure 5
An example of DuPont Model analysis

International aspects of finance

As mentioned above, increased global cooperation and competition is one important characteristic of modern supply chain management. Supply chain professionals and managers need to understand international aspects of finance, in particular the currency exchange and its impact on their global supply chain. In today's worldwide sourcing, indirect procurement costs such as shipping, warehouse handling, administrative overhead, and inventory carrying charges should be considered as parts of the total cost. In addition, tariffs, duties, and local taxes involved in international trade will also affect the total cost of sourcing. Fluctuation in currency exchange rate will have an impact on the costs and expenses related to the procurement in the global market.



Figure 6

Foreign exchange information platform in Bloomberg Terminal

Bloomberg terminals have a comprehensive portal for supply chain professionals and managers to understand and analyze international aspects of finance. As shown in Figure 6, Foreign Exchange Information Platform (FXIP) contains current and historical data about currency exchange rates and related financial data. It carries data about spot rates and forward rates for major currencies in the whole world. It also allows users to conduct fundamental as well as technical analysis on exchange rates.

4. Discussion

As we mentioned in the second section, there is an increasing need for supply chain professionals and managers to develop financial competency. While we can identify the specific financial concepts and techniques, it is still a challenging task to help supply chain professionals and managers to effectively learn and apply them. This is the major reason for which we propose the use of Bloomberg terminal, as an information resource and analytical tool.

In the existing literature, there are empirical studies (Athavale et al., 2016; Coe, 2007; Keys, 2016; Lei & Li, 2013; Scott, 2010; Sharma, 2015; Tuluca & Zwick, 2016) on the use of Bloomberg terminals in finance training and education. Many advantages of applying this type of information system to learning have been discussed. The major benefits include:

1. Bloomberg terminals make the learning of financial concepts and knowledge relevant to the users by showing real business data;
2. Bloomberg terminals provide reliable, valid and updated data compared to other free financial services;

3. Bloomberg terminals allow users to export current as well as historical data to Excel software to conduct additional in-depth analysis;
4. Bloomberg terminals contain many specialized analytical tools, functions, and research reports that are not available to the public or on general financial data website.

Together, these benefits can better motivate and stimulate the learning of financial concepts by supply chain professionals and managers who are new to the field of finance.

In addition to these advantages, we also noted some limitations of Bloomberg terminals. The major limitation is about its cost. While they are widely used in financial industry, other companies may find the price of Bloomberg terminals, around \$25,000 a year for one terminal, too high. Companies should conduct a cost-benefit analysis to justify the use of such a resource for supply chain professionals and managers to develop financial competency and apply the required financial analysis for decision-making. Of course, that the Bloomberg terminal is valuable for other professionals in a company thus the cost might be much less than the benefits. Another potential limitation is the Bloomberg terminal's user interface, which is not similar to other commonly used Graphic User Interface (GUI) applications in Windows or Mac OS. Professionals may also face the difficulty in memorizing the commands for certain financial functions. We believe that this drawback seems as a hindrance in the process but it is easily eliminated with the increased frequency of usage and the online help that is readily available on the platform.

In summary, Bloomberg terminals offer significant benefits in mastering financial knowledge. However, acquiring the system and learning the tools needed would require substantial monetary and time investment. Once the investment is made, Bloomberg terminals will prove to be an almost unlimited resource for supply chain professionals.

5. Conclusion

In this paper, we discuss the need for supply chain professionals and managers to develop financial competency. Through the literature review, we identify a number of "must know" financial topics for the supply chain professionals and managers. We then propose a few financial techniques for analysis in the context of supply chain management. In addition, we suggest and detail using Bloomberg terminals to enhance the understanding of financial concepts and facilitate the financial analysis needed for supply chain management and decision-making.

There are more features and functions available in Bloomberg that are useful to SCM, which were not the object of the current paper. We hope that this paper provides a useful road map to financial decision making for supply chain management using Bloomberg as an information system and analysis platform that will help the professionals interested in applying financial concepts to supply chain activities develop the necessary competency for an efficient and value creation decision making.

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