

Short notes

Financial Management of Supply Chains In Vietnam: A Case Study of Companies In The Steel Industry

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Abstract - Along with globalization's trend, Vietnamese traditional businesses' cash consumption habits in the business made some constraints, such as may not order or produce optimally. In Viet Nam, money acts as a catalyst if potential demand is high, but financial constraints leave them no choice but to order less. So implications for the supply chain can be detrimental where lack of financial resources at one level can plague the performance of the whole supply chain, at least temporarily until restored. This article focused on the analyzed length of inventory conversion (DIO), the Receivable Conversion (DSO), the payable conversion (DPO), and cash conversion cycle (CCC) (that is some of the important parts in the financial management of supply chains) inside of the companies in the steel industry because they're directly related to the supply chain used by the sample companies. Based on the analysis data, the author recommended application solutions for the sample companies.

Keywords - Finance, supply chain, the steel industry, capital, cash conversion cycle.

I. INTRODUCTION

After more than 8 years of joining the World Trade Organization (WTO), on September 31, 2015, the ASEAN Economic Community (AEC) was formally established. AEC's purposes are to create a single market and production base, a competitive economic region, a region of equitable economic development, and a fully integrated region into the global economy within ASEAN. AEC created not only many opportunities but also many challenges for Vietnamese businesses. One of the challenges is financial problems. Financing is extremely necessary for firms, for investments in production processes, and expansion in markets.

On the other hand, alongside globalization, companies are oriented to produce an international product, which will be sold globally. Thus participation in global supply chains is inevitable. With this trend, companies increasingly focus on their core capabilities, and they not only concentrate on building an efficient supply chain but

also manage the supply chain comprehensively. One of the important parts of supply chain management is financial management. This article focused on the financial management of supply chains inside the companies in the steel industry, especially analyzed length of accounts receivables and cash conversion cycle because they're directly related to the sample companies' supply chain. Based on the analysis data, the authors recommend application solutions for the sample companies. Therefore, enterprises can use these results to build cash conversion cycle policies by impacting the length of accounts receivables, accounts receivable, Inventory conversion, cost, and revenue.

II. LITERATURE REVIEW

Eventually, the goal is to obtain visibility over the purchase-to-order and order-to-cash processes. This can lead to efficiencies and cost savings throughout the chain. The better the parties know how and where the cash flows throughout the chain, the better companies may optimize these flows and may need less working capital resulting in fewer credits to be obtained from banks. This will lead to cost savings for all parties and, consequently, to more investment opportunities.

Dan Xu Bærentsen, in the author's thesis about The Impact of Supply Chain Finance on Corporate Performance: Improving Supply Chain Efficiency and Increasing Profitability (2012), the author studied supply chain application finance (SCF) in supply chain management. In the author's opinion, the SCF is called supplier finance, and mainly it is used to deal with the financial issues in supply-side value chain management. The impact of SCF on corporate performance reflects improved supply chain efficiency in cost-saving payable processes and payment term extension.

According to the author, if considered suppliers and buyers to share in a house when the suppliers apply for the SCF program, it brings a new financial solution to supply chain management, considering the third party financial services. The reverse factoring allows the buyer to help the supplier receive better terms of capital financing through



the financial provider's IT platform. The SCF program is a superior solution for supply-side value chain management.

Both the buyer and the supplier can benefit from the SCF program. Most importantly, the buyer can pursue a tactic strategy to lengthen payment terms without extracting extra costs from the supplier and improving the economic value added (EVA). The lower cost of financing and speed-up cash flows are the most significant achievements for the supplier.

The SCF program has insight into becoming popular concerning the positive outcomes from both the buyer's and the suppliers' perspectives.

Virgil Popa (2013), with the financial supply chain management: a new solution for supply chain resilience, in this paper, the author found solutions to optimize the supply chain for the cash flow - a flow of products received from the physical one and the two ways flow of information.

Hans Candies and partners (2014) in Managing risk: Supply chain finance, based on businesses face an ever-changing global environment, the issues of maximizing cash generation, managing working capital, and supporting the credit needs of the supplier base become more and more important to increase profitability and enhance shareholder value. The authors provided an introduction to supply chain finance, describes its impact on organizations and presents an overview of the ways companies are responding to the marketplace.

III. DATA AND ANALYSIS

The study data has been collected from the Annual Report for 5 years, 2015 to 2019, of 5 companies in the Vietnam steel industry (Fig.1). The companies selected for the study are Hoa Phat Group Joint Stock Company (HPG), Thai Nguyen iron and steel joint-stock corporation (TISCO), Hoa Sen Group (HSG), Hoa Sen Group (HSG), and Vietnam Germany Steel pipe joint-stock company (VGPIPE). These companies were rated by Vietnam Report and Vietnam net in December 2020.

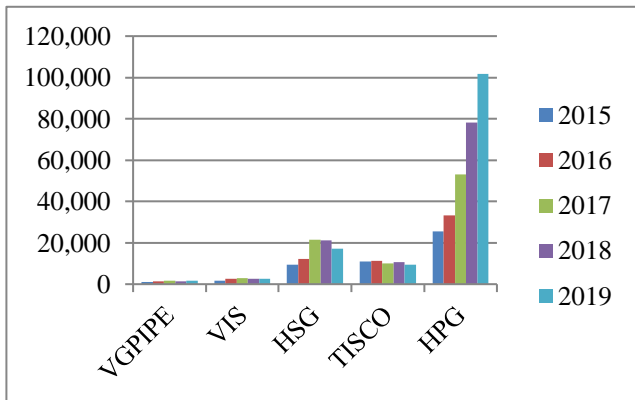


Fig. 1 Represents Total Assets of sample companies (Unit: VND Billion)

The basic data is acquired from the financial statements presented in the companies' annual reports and then process with the basic formulas to fit in the cash conversion cycle (more information is provided in

Appendix A). It includes data of sales, cost of goods sold, receivables, payables, and Inventory. This data is used to calculate the receivable collection period, the inventory conversion period, the payables deferral period, and the cash conversion cycle. For that purpose, this paper calculated Average Accounts Receivable (Avg. A/R), Average Accounts Payable (Avg. A/P), Average Inventory, Cost of Goods Sold, Net revenue from goods sold and services rendered (Net revenue), Annual sales purchases (Sales) and Net Working Capital (Net W/C).

The three basic components of the cash conversion cycle are calculated by using the above data. These components are Inventory Conversion Period, Receivable Conversion Period, and Payable Conversion Period.

A. Inventory Conversion Period

The inventory conversion period (or Days Inventory Outstanding – DIO) is essentially the period when a company must invest cash while it converts materials into a sale. The calculation is [6]:

$$DIO \text{ (days)} = \frac{\text{Average Inventory} * 365}{\text{Cost of Goods Sold}}$$

This calculation is important because it is part of the cash conversion cycle. The cash conversion cycle tells a company how long it takes from paying cash for the company's Inventory to when it is paid for the Inventory.

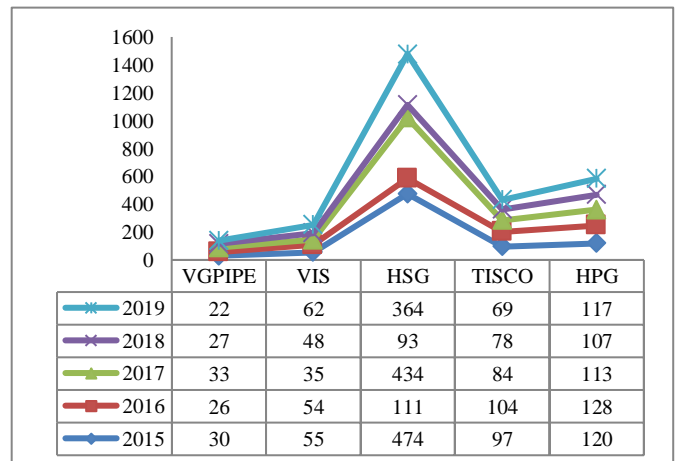


Fig. 2 Represents Inventory Conversion Period of sample companies (Unit: Days)

(Source: Calculated by the author)

VGPIPE was at the top position with an average DIO of 28 days, followed by VIS (51 days), HSG was at the last position with an average of 295 days (more information provided in Fig 2).

B. Receivable Conversion Period

A comparison of the receivables to the sales activity is called the accounts receivable collection period or days sales outstanding (DSO).

This comparison is used to evaluate how long customers are taking to pay for a company. A low figure is considered best since it means that a business locks up less of its funds in accounts receivable to use the funds for other purposes. Also, when receivables remain unpaid for a reduced period, there is less risk of payment default by

customers. Receivable Conversion Period formulas, as mentioned below [6]:

$$\text{DSO (days)} = \frac{\text{Average Accounts Receivable} * 365}{\text{Net revenue}}$$

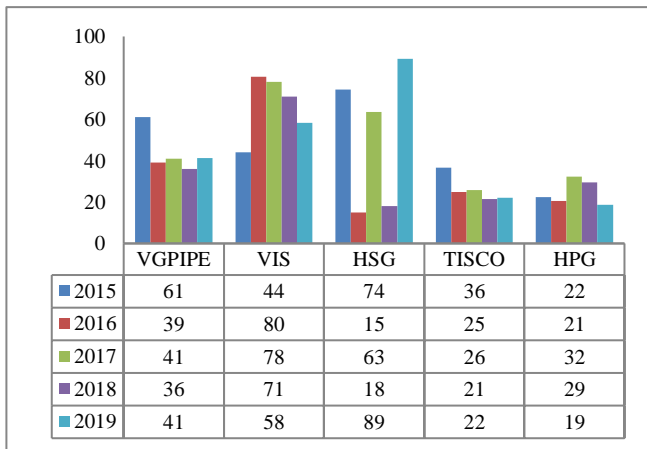


Fig. 3 Represents Receivable Conversion Period of sample companies (Unit: Days)

(Source: Calculated by the author)

Fig. 3 exhibits the various time representing the Represents receivable conversion Period of sample companies. HPG was at the topmost position with an average DSO of 25 days, followed by TISCO (26 days), VGPIPE was at the third with an average of 44 days, VIS was at the bottom-most position (66 days).

C. Payable Conversion Period

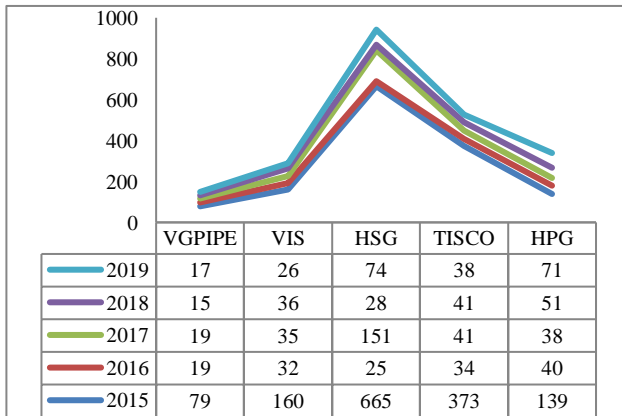


Fig. 4 Represents Payable Conversion Period of sample companies (Unit: Days)

(Source: Calculated by the author)

The payable conversion period (or Days payable outstanding - DPO) measures management's ability to delay payment to vendors. In other words, the accounts payable deferral period measures the average delay between when a bill is received and when it is paid. The formula for payable conversion period is [6]:

$$\text{DPO (days)} = \frac{\text{Average Accounts Payable} * 365}{\text{Annual sales purchases}}$$

Inference from Fig 4, VGPIPE was ranked in top DPO with a composite average of 30 days, followed by VIS (58 days), while HSG stood at the bottom with a composite average of 188 days.

D. Cash conversion cycle (CCC)

The cash cycle time from procurement is defined as the elapsed time between the cash payments for materials up to the receivables for sales of the finished products (More detail in Fig. 5). The cash flow cycle time highlights how quickly a company can convert its products into cash through sales. Over time, a rising trend of the cycle specifies the company may be facing a cash flow crisis in the near future. So the cash flow cycle is an indicator to specify the condition of working capital, and it is used to detect non-value-adding processing time in the supply chain [2].

The cash conversion cycle (CCC) combines several activity ratios involving accounts receivable, accounts payable, and inventory turnover. In essence, the ratios indicate how efficiently management is using short-term assets and liabilities to generate cash. This allows an investor to gauge the company's overall health. The CCC is expressed as days and calculated as [6]:

$$\text{CCC} = \text{DIO} + \text{DSO} - \text{DPO}$$

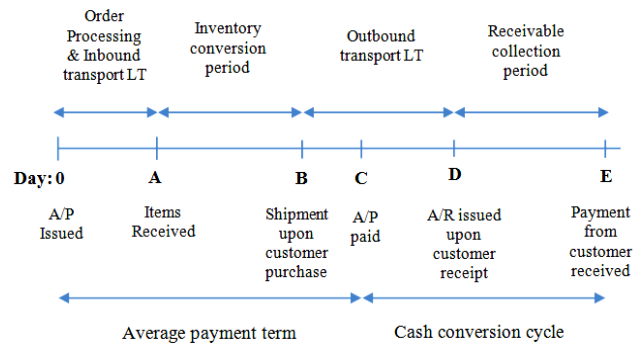


Fig 5. Cash Conversion Cycle considering Lead Time Factor [2]

Cash Conversion Cycle is used to track a company over time and compare its competitors. When tracking over time, determine CCC over several years and look for an improvement or worsening of the value. As it is calculated, for an average of 5 years, from 2011 to 2015, TISCO's average CCC was 7 days. The causes of this problem were: the decreasing Inventory Conversion Period has down steadily over five years (by 35 days from 2016 to 2019). However, when looking at each year's detailed data, the author sees that the company hasn't shown an improvement between 2015 and 2019 because the Account Payables period is usually longer than the Account Receivables Period.

With VGPIPE, the average CCC was 41 days. In 2015, VGPIPE's CCC was 13 days, increased to 55 days in 2017, then gradually decreased over the period 2018-2019. The cause of this fluctuation was due to the large change of DPO. It means the company has shown an improvement to extend the accounts payable life compared to the receivable. At the same time sales is also increased considerably. VGPIPE achieved this improvement by decreasing the Inventory Conversion Period by 8 days from 2015 to 2019, decreasing the Accounts Receivable conversion Period by 20 days from 2015 to 2019, and decreasing the Accounts Payable Conversion Period by 62 days during this same period. Although the change is good between these years, the Accounts Receivable conversion

period and Accounts Payable Conversion Period might merit more investigation. Still, some of the causes have related to increasing sales targets.

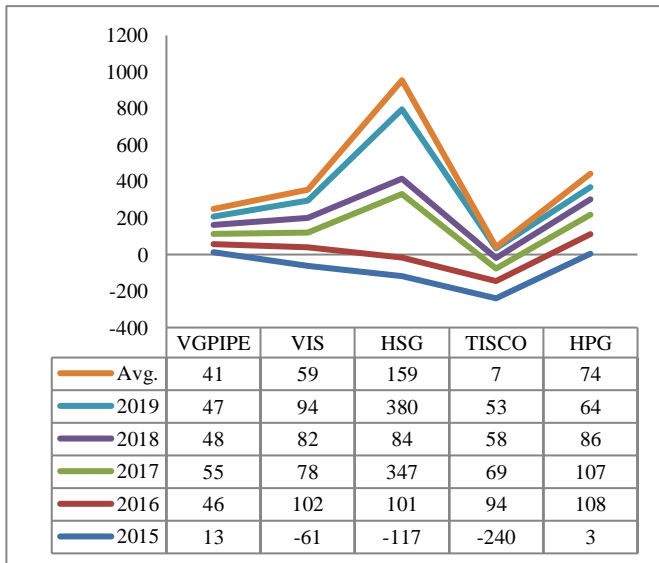


Fig 6. Represents the Cash Conversion Cycle of sample companies (Unit: Days)

(Source: Calculated by the author)

CCC is also calculated for the same periods for VIS, HSG, and HPG. Compared to VIS, HSG, TISCO, and HPG, VGPIPE is doing a better job at moving Inventory (relatively low and stable Inventory Conversion Period), is quicker at collecting what it is owed (lower Accounts Receivable Conversion Period), and keeps its own money a bit longer (higher Accounts Payable Period).

It is clear from the above results after calculating the CCC that even the sales are considerably increased in the steel industry, but there isn't much company that managed CCC well. Most of the sample companies have not managed CCC effectively. This means that financial supply chains and financial supply chain management are not yet properly care for.

IV. RECOMMENDED APPLICATION SOLUTIONS FOR SAMPLE COMPANIES

The introduction of the supply chain finance (SCF) program to supply chain management can be seen as part of the design of supply chains' financial flows. Supply chain decisions are usually close to operational management instead of financial management. However, the SCF program is a financial solution to develop the supply chain management, and in return, the improved supply chain efficiency will enhance financial performance.

The application of the supply chain finance (SCF) program in supply chains will help companies balance the interests between the seller and the buyer, because the conflicted goals between buyers and suppliers increase the complexity to build up a mutually beneficial process. The buyers wish to delay payment for their specific financial situations and the suppliers want to accelerate collections.

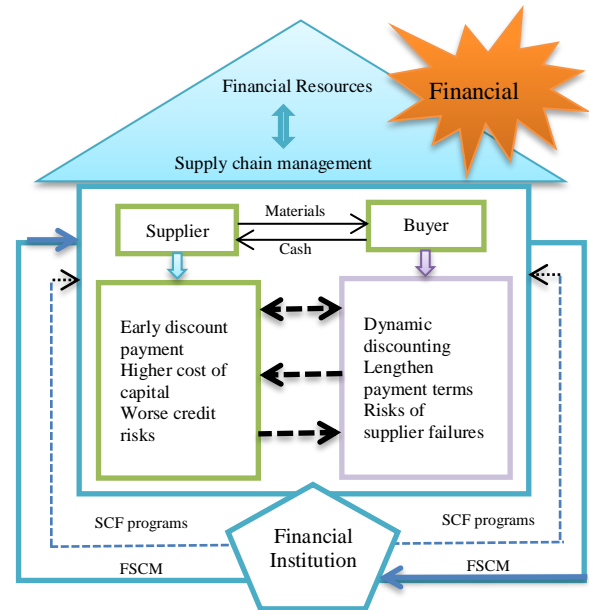


Fig. 7 Financial issues on supplier-buyer relationships in supply chain management

(Source: According to suggest by the author)

Fig.7 shows how the benefits of applying the SCF program, as following:

Benefits for supplier include: Better financing cost (early discount payment according to buyer's cost of money); Alternate source of liquidity (to securitize cash flow with buyer's credit rating); Reduced disputes of payable processes; More predictable cash flows; And improved credit rating to avoid default risks.

Benefits for buyer encompass: To negotiate payment term extension with suppliers and improve economic value added; Reduced operating process costs and increased standardization of process; Better cash flow management; And improved supplier-buyer relationships.

Overall it is important to consolidate the financial supply chain into a synchronized system through high degree of information sharing and trust. Financial institution must follow all the payable and business processes, especially the receipt of goods. It is the trigger for the financial institution to pursue future payment to the supplier. The payable processes built upon the SCF platform's basis have simplified the upstream cash flows in the supply chain between the buyer and the supplier. It also liquidates the tied-up working capital in business processes. The supplier gets paid from the financial institution before the maturity, and the buyer pays to the financial institution regarding a lengthened maturity.

VI. CONCLUSION

Cash Conversion Cycle is a comprehensive financial measurement that incorporates a business entity's financial and operative considerations. Since it is the period between payment to the suppliers and receipt of money from the customers, it refers to days that the company needs outside financing. In that sense, many researchers promote shorter Cash Conversion Cycle; however, many studies use project-scheduling techniques in shortening the CCC,

showing that the company should not push to shorten this optimal value at the expense of losing money. In this study, the authors only concentrated on the Cash Conversion Cycle, a comprehensive metric that the companies can use to evaluate their financial and operational policies. It makes more sense when it is

calculated for consecutive periods to see the change over time or compared with several competitors. Based on the analysis data, the authors recommend application solutions for the sample companies, and thereby, enterprises can use these results in building financial policies and financial management model of supply chains

APPENDIX A

Structured Data for Analysis (Unit: VND) [9]

		VGPIPE	VIS	HSG	TISCO	HPG
Avg. Inventory	2015	272.839.630.555	441.167.356.549	4.145.368.219.276	1.957.251.082.827	7.161.915.417.615
	2016	302.145.785.875	517.020.348.936	4.174.715.369.788	2.244.147.341.471	8.592.308.733.881
	2017	518.736.969.581	573.288.853.410	6.902.120.449.689	2.098.531.197.658	10.998.024.481.186
	2018	506.027.328.566	702.873.607.577	7.794.867.191.312	2.214.867.183.211	12.932.006.165.292
	2019	398.073.720.184	787.498.071.336	5.510.726.611.175	1.878.171.980.791	16.763.530.898.502
Avg. A/R	2015	572.740.207.865	375.490.631.960	801.660.006.001	789.506.357.344	1.678.479.651.285
	2016	622.956.202.576	882.110.852.012	906.318.994.835	815.000.294.652	2.018.852.748.260
	2017	775.825.524.128	1.372.651.255.381	1.476.117.267.014	892.721.951.881	4.495.116.522.475
	2018	746.129.606.498	1.143.892.953.556	2.073.566.479.537	818.489.645.442	4.904.904.871.804
	2019	835.526.470.455	868.856.344.153	1.937.775.930.347	777.989.590.850	3.410.847.599.548
Avg. A/P	2015	742.618.220.245	1.379.879.289.632	7.178.167.424.005	8.084.423.878.641	10.581.911.727.215
	2016	236.967.648.599	330.257.421.313	1.214.660.184.101	816.351.762.942	3.729.279.472.425
	2017	320.271.794.788	597.820.728.876	2.887.703.181.536	1.082.554.375.041	4.910.236.165.462
	2018	291.431.836.378	526.615.311.069	2.605.245.873.118	1.242.886.890.164	7.883.081.663.189
	2019	313.458.937.650	335.459.253.967	1.284.380.446.768	1.089.457.499.156	12.641.916.173.494
Cost of Goods Sold	2015	3.274.378.935.139	2.946.376.838.639	3.189.763.923.362	7.351.327.015.327	21.858.956.167.813
	2016	4.301.381.574.111	3.505.639.709.791	13.717.739.386.963	7.872.342.211.461	24.532.650.483.985
	2017	5.747.586.684.599	5.895.922.223.761	5.805.971.310.110	9.166.557.526.077	35.536.120.587.221
	2018	6.737.602.157.757	5.389.258.587.892	30.464.290.088.385	10.400.593.538.696	44.165.626.148.685
	2019	6.611.057.507.625	4.653.000.580.210	5.518.633.261.087	9.920.752.175.254	52.472.820.451.654
Sales	2015	3.444.877.662.763	3.151.285.991.344	3.937.927.781.526	7.900.843.435.398	27.864.558.436.964
	2016	4.579.290.686.047	3.773.354.838.762	18.006.498.541.322	8.678.490.505.555	33.884.892.008.435
	2017	6.011.511.812.904	6.149.639.450.515	6.991.943.922.009	9.725.706.776.775	46.854.825.722.466
	2018	6.946.724.677.588	5.313.513.901.235	34.570.344.557.164	10.935.150.676.935	56.580.423.695.083
	2019	6.854.778.062.411	4.669.504.562.200	6.357.523.506.755	10.472.711.391.888	64.677.906.575.644
Net revenue	2015	3.428.490.627.199	3.102.704.319.115	3.932.110.544.778	7.899.336.873.348	27.452.932.114.333
	2016	4.550.905.327.894	3.739.537.345.200	17.893.715.480.953	8.578.150.179.555	33.283.210.159.987
	2017	5.980.106.005.543	6.105.119.145.291	6.937.387.876.334	9.725.418.315.075	46.161.691.614.304
	2018	6.919.955.592.184	5.228.839.031.809	34.441.429.348.261	10.934.737.756.635	55.836.458.379.759
	2019	6.836.496.479.785	4.593.003.784.174	6.349.820.490.924	10.433.298.694.288	63.658.192.673.791
NWC	2015	57.752.750.731	-162.907.626.587	-343.794.660.552	-304.218.248.945	1.922.344.377.800
	2016	188.777.421.866	29.889.824.795	300.108.745.682	-291.025.985.642	6.197.766.474.144
	2017	243.618.472.153	486.280.825.742	-648.868.615.998	-1.057.761.176.889	14.548.337.732.312
	2018	222.395.062.787	188.958.996.623	-1.837.808.259.824	-1.992.463.455.374	2.672.575.695.482
	2019	302.959.216.032	50.169.210.355	-1.436.340.911.580	-2.885.232.887.649	3.452.738.721.917

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