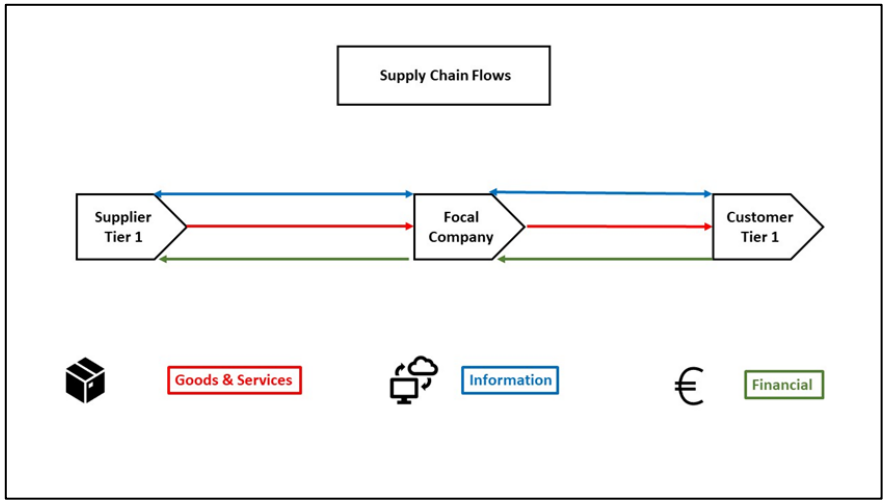
Glossary Supply Chain Finance



Author: Jan H Jansen

Arnhem (NL), 17 August 2021 (V5)

Preamble

The goal of this glossary is to help students of Finance to understand some of the basic Logistics / SCM definitions, or students of Logistics / SCM to understand some of the basic Finance definitions, or for students of Marketing / Business Administration / Industrial Engineering to understand both topics.

Nice literature to study before studying supply chain finance is: Marketing (Kotler, 2000), Purchasing (Van Weele, 2010), Logistics / SCM (Harrison & Van Hoek, 2011) and Finance (Hillier, Clacher, Ross, Westerfield, & Jordan, 2011).

Lean accounting (Maskell, Baggeley, & Grasso, 2011) is an interesting approach to optimise O2C & P2P processes in a company.

Acknowledgements

After publishing the first version I received many remarks for improvement and/or to add topics to this glossary. I am very grateful to:

- Mrs Monika Bal, Poznan University of Economics, Poznan (Poland)
- Mr Andrey Vinogradov, National research University Highers School of Economics Moscow, Moscow (Russia)
- Mr Georgios Vousinas, National Technical University of Athens, Athens (Greece)

Topic	Description (& Source)
Blockchain (Enterprise)	*'A shared , decentralised, cryptographically secured, and immutable digital ledger; with the following key attributes: Accountability, Privacy, Scalability, Security, and Motivational'* (Arun, Cuomo, & Gaur, 2019)
Capital Asset Pricing Model (CAPM)	*'Model in which expected returns (R_E) increase linearly with an asset's beta (β)'* $R_E = R_{RF} + \beta * (R_M - R_{RF})$ R_E = Required Return on Equity, R_{RF} = Risk free interest rate, R_M = Expected Market Return , β = Measure of market risk (Brealy, Myers, & Allen, 2020)
Capital Employed (CE)	Capital Employed (CE) = Fixed Assets + Net Working Capital (Atrill & McLaneyEddie, 2013)
Cash to Cash Cycle (CCC or C2C)	$CCC = DIO + DSO - DPO$ (Templar, Hofmann, & Findlay, 2016) (Brealy, Myers, & Allen, 2020) (Zhao & Huchzermeier, 2018)
Crop Financing	Crop financing is a promissory note (PN) issued by a farmer or farmer organization to deliver a certain amount of farm produce—crops or livestock—or the cash equivalent thereof at a future date (Hollinger & Gross, 2019)
Current Ratio (CR)	$Current\ Ratio\ (CR) = \frac{Current\ Assets}{Current\ Liabilities}$ (Brealy, Myers, & Allen, 2020)
Days in Inventory Outstanding (DIO)	$DIO = \frac{Inventories}{COGS} * 365\ days$ (Zhao & Huchzermeier, 2018), (Templar, Hofmann, & Findlay, 2016) (Brealy, Myers, & Allen, 2020)
Days in Sales Outstanding (DSO)	$DSO = \frac{Debtors\ (AR)}{Revenues} * 365\ days$ (Zhao & Huchzermeier, 2018), (Templar, Hofmann, & Findlay, 2016) (Brealy, Myers, & Allen, 2020)

Topic	Description (& Source)
Days in Purchases Outstanding (DPO)	$$DPO = \frac{Creditors\ (AP)}{COGS} * 365\ days$$ (Zhao & Huchzermeier, 2018), (Templar, Hofmann, & Findlay, 2016) (Brealy, Myers, & Allen, 2020)
Debt ratio (λ)	$$\lambda = \frac{Liabilities}{Assets}$$ (Brealy, Myers, & Allen, 2020)
DuPont formula	Return on Equity (ROE) = Net Profit Margin (NPM) * Total Assets Turnover (TAT) * Equity Multiplier (EM) or I a formula: $$ROE = NPM * TAT * EM$$ (Brealy, Myers, & Allen, 2020) (Van Horne & Wachowicz, 2001)
Dynamic Discounting	*'Dynamic payables discounting is a process which allows buyers and suppliers of commercial goods and services to dynamically change the payment terms to accelerate payment based on a sliding discount scale'* (Bryant & Camerinelli, 2014)
Economic Value Added (EVA)	EVA = NOPAT – CE * WACC NOPAT = Net Operating Profit after Taxes, CE = Capital Employed, and WACC = Weighted Average Costs of Capital (Brealy, Myers, & Allen, 2020)
Enterprise Resource Planning (ERP)	*'Enterprise Resource Planning: The integration of all significant resource planning systems in an organisation that, in an operations context, integrates planning and control with the other functions of the business'* (Slack, Brandon-Jones, & Johnston, 2016)
Effective Annual Rate (EAR)	$$EAR = \left\{\left(\left(1 + \frac{d}{100 - d}\right)^{\frac{365}{PT-EP}}\right) - 1\right\} * 100\%$$ PT = payment term (e.g. 90 days), EP = earlier payment (e.g. 10 days), D = discount percentage (Brealy, Myers, & Allen, 2020)

Topic	Description (& Source)
Equity Multiplier (EM)	$$EM = \frac{Assets}{Equity}$$ (Brealy, Myers, & Allen, 2020)
Equity Ratio (ε)	$$\varepsilon = \frac{Equity}{Assets}$$ (Brealy, Myers, & Allen, 2020)
Factoring	*'Factoring (as an example of Receivable Finance) allows suppliers to finance their receivables relating to one or many buyers and to receive early payment, usually at a discount on the value'* (Bryant & Camerinelli, 2014)

Financial Risk (part of SCRM)	• Endogenous financial risk
	  ○ Budget constraints
	  ○ Financial distress costs
	  ○ Bankruptcy risk
	  ○ Tax deductions
	  ○ External debt costs
	  ○ Agency and transaction costs
	• Exogenous financial risk
	  ○ Interest rate risk
	  ○ Exchange rate uncertainty
	  ○ Asset price uncertainty
	  ○ Commodity price risk
	  ○ Derivative price uncertainty
	(Zhao & Huchzermeier, 2018)

FinTech	*'Fintech is a new financial industry that applies technology to improve financial activities'* (Schueffel, 2016)
Inventory financing	*'Inventory (or warehouse) financing is a form of trade finance in which goods are held in a warehouse for a buyer, usually by the supplier (could be a third party) until needed'* (Bryant & Camerinelli, 2014)
Kraljic's matrix	Kraljic's matrix characterises the company's purchase portfolio:

<table>
<tr><th>Topic</th><th>Description (& Source)</th></tr>
<tr><td></td><td>
<table>
<tr><th>Supply Risk →
Financial Impact ↓</th><th>Low</th><th>High</th></tr>
<tr><td>High</td><td>Leverage products</td><td>Strategic products</td></tr>
<tr><td>Low</td><td>Routine products</td><td>Bottleneck products</td></tr>
</table>

(Van Weele, 2010)
</td></tr>
<tr><td>Lean Accounting</td><td>‘Applying Lean principles to the accounting functions of an organisation’

Accounting functions: Accounting, Measurement, and Management of a business.

‘The real control is on the shop floor, so accountants should assist the shop floor personnel in implementing these controls and should be involved in the assurance that the controls are in place and operating as planned’

‘Waste must be eliminated to free up accountants from routine transaction audits and administration, so the can ger involved into the Lean improvements that will be under way once value streams are put into place’

‘Kaizen or Continuous Improvement is foundational to Lean thinking … it means that that the organization develops a working culture whereby everyone in the company is engaged not only in performing their tasks but also in making daily improvements to their processes’

(Maskell, Baggeley, & Grasso, 2011)

So O2C (selling) & P2P (purchasing) are NOT stand alone processes, but integrated in the Lean system of the company. This is an important paradigm shift for accountants and managers.</td></tr>
<tr><td>Net Income</td><td>
<table>
<tr><td>Sales or Revenues</td></tr>
<tr><td>- Cost of goods sold (COGS)</td></tr>
<tr><td></td></tr>
<tr><td>Gross Margin</td></tr>
<tr><td>- Selling, General & Administrative Expenses</td></tr>
</table>
</td></tr>
</table>

Topic	Description (& Source)
	Net Income before taxes or EBIT - **Corporate taxes** **Net Income** (Brealy, Myers, & Allen, 2020) (Van Horne & Wachowicz, 2001)
Net Operating Profit After Taxes (NOPAT)	NOPAT = Net Income + After-Tax Interest (Brealy, Myers, & Allen, 2020)
Net Working Capital (NWC)	NWC = Current Assets – Current Liabilities (Brealy, Myers, & Allen, 2020)
Net Operational Working Capital (NOWC)	NOWC = Inventories + Debtors (AR[1]) – Creditors (AP[2]) (Zhao & Huchzermeier, 2018) (Brealy, Myers, & Allen, 2020) In some literature the word **induced** is used instead of operational (Dorsman, 2002) (Gieskens, n.d.)
Net Profit Margin (NPM)	$NPM = \frac{Net\ Income}{Sales}$ (Van Horne & Wachowicz, 2001)

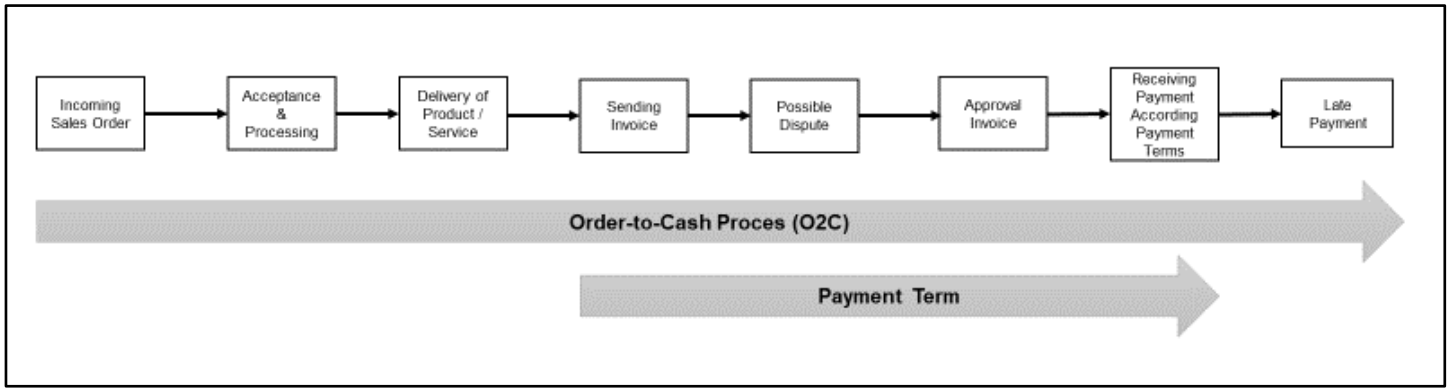
Operational Risk (part of SCRM)	• Supply Risk
	  ○ Supply disruption risk
	  ○ Uncertain supply capacity
	  ○ Uncertain input prices
	  ○ Uncertain lead times
	• Processing Risk
	  ○ Processing disruption risk
	  ○ Uncertain processing capacity
	  ○ Technological risk
	  ○ Processing yield risk
	  ○ Uncertain processing costs

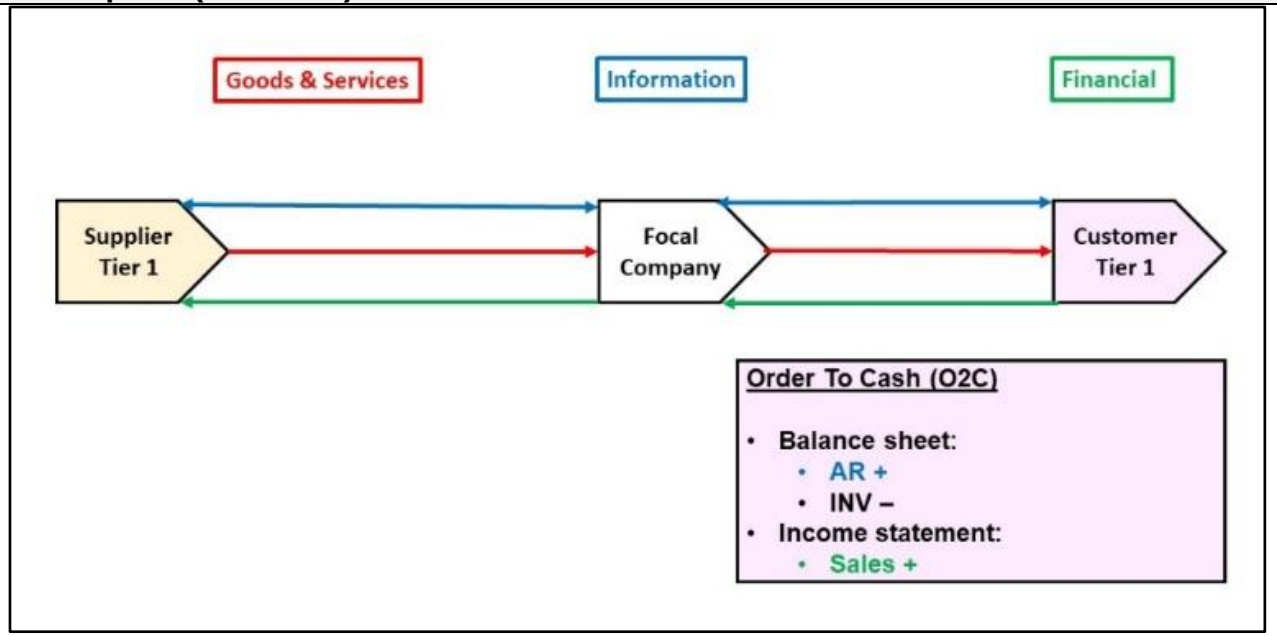
[1] AR = Account Receivables = Debtors

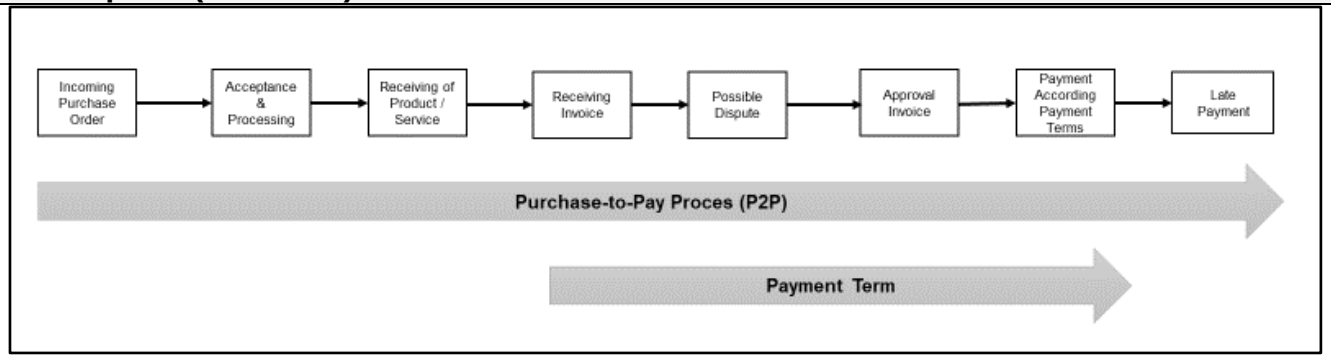
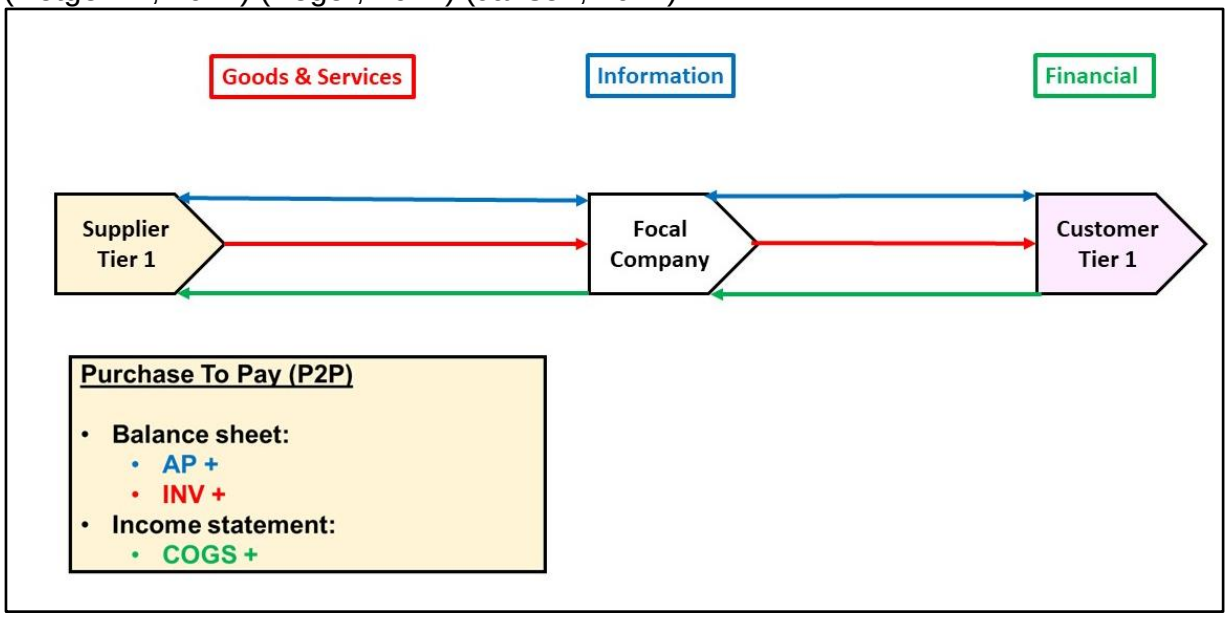
[2] AP = Account Payables = Creditors

Topic	Description (& Source)

	• Demand Risk
	  ○ Product demand risk
	  ○ Market demand risk
	  ○ Uncertain output prices
	  ○ Uncertain service costs
	  ○ Marketing and sales risks
	  ○ Distribution risks
	(Zhao & Huchzermeier, 2018)

Order to Cash process (O2C)	The process from receiving an order to receiving the cash from that sales order (selling process).  (Veger, 2021) (Rotgerink, 2021) (Jansen, 2021)

Topic	Description (& Source)
	 (Jansen, 2021)
Pipeline Inventory	The inventories in the pipeline of Supply (purchase order), Manufacturing, and Distribution / Sales (customer orders) in terms of inventory costs (including the costs of financing, storage, and transport) (Ploos van Amstel & Farmer, 1991)
Purchase Order Finance or Pre-shipment finance	*'Purchase Order Finance is made available to a seller based on a purchase order received from a buyer. This financing can cover all the related working capital needs of the seller including raw materials, wages, packing costs and other pre-shipment expenses. Once the goods are ready, refinancing or repayment can occur.* (Bryant & Camerinelli, 2014)
Purchase to Pay process (P2P)	The process from ordering to the payment of cash from that purchase order (purchasing process).

Topic	Description (& Source)
	 (Rotgerink, 2021) (Veger, 2021) (Jansen, 2021)  (Jansen, 2021)
Quick ratio (QR)	$Quick\ Ratio\ (QR) = \frac{Cuurent\ Assets - Inventories}{Current\ Liabilities}$ (Brealy, Myers, & Allen, 2020)

Topic	Description (& Source)
Reverse factoring	*'The financing bank (often buyer's own bank) normally receives a file of approved payables or approved invoices from the buyer and settles these directly in favour of the supplier in advance of their original due date whilst taking an assignment of or purchasing the supplier receivable'* (Bryant & Camerinelli, 2014)
Return on Capital Employed (ROCE)	$ROCE = \frac{Operating\ Profit}{Equity + Long\ term\ liabilities} * 100\% = \frac{Operating\ Profit}{Fixed\ Assets + Net\ Working\ Capital} * 100\%$ (Atrill & McLaneyEddie, 2013)
Supply Chain Financial Bullwhip Effect (SCFBE)	*'A phenomenon on the financial flow level of a supply chain which involves the increasing amplification of financial distortion along it'* (Vousina, 2019)
Supply Chain Finance, definition	*'Supply chain finance (SCF) is the inter-company optimisation of financing as well as the integration of financing processes with customers, suppliers, and service providers in order to increase the value of all participating companies'* (Pfohl & Gomm, 2009)
Supply Chain Finance, definition	*'Financial arrangements in the form of debt, equity or financial contracts used in collaboration by at least two supply chain partners and facilitated by the focal company with the aim to improve the overall financial performance and mitigate the overall risks of the supply chain'* (Steeman, 2014)
Supply Chain Finance, definition	*'The use of financial instruments, practices and technologies to optimise the management of the working capital and liquidity tied up in supply chain processes for collaborating business partners. SCF is largely 'event-driven'. Each intervention (finance, risk mitigation or payment) in the financial supply chain is driven by an event in the physical supply chain. The development of advanced technologies to track and control events in the physical supply chain creates opportunities to automate the initiation of SCF interventions'* (Bryant & Camerinelli, 2014)

Supply Chain Finance Instruments (classification)	• Strategic (Equity related)
	  ○ Take-over / Merge
	  ○ Joint venture
	  ○ Minority interest
	• Tactical (Fixed asset financing)

Topic	Description (& Source)
	○ Equipment financing ○ Pay on production ○ Vendor leasing ○ Supplier subsidies • Operational ○ Reverse factoring ○ Dynamic discounting ○ Inventory financing ○ Purchase Order financing ○ *Crop financing (added by the author)* ○ *Pipeline inventory financing (added by the author)* (De Boer, Steeman, & Van Bergen, 2015)
Supply Chain Risk Management (SCRM)	*'The joint analysis, synthesis, and optimization of operational and financial risk management across functional units in an enterprise and across supply chain partners'* • Operational Risk (have a look at this topic) • Financial Risk (have a look at this topic) (Zhao & Huchzermeier, 2018)
Total Asset Turnover (TAT)	$$TAT = \frac{Sales}{Assets}$$ (Brealy, Myers, & Allen, 2020)
Weighted Average Costs of Capital (WACC)	$$WACC = \varepsilon * R_E + \lambda * R_D * (1 - t)$$ E = Equity ratio, R_E = Required Return on Equity (see CAPM), λ = Debt ratio, R_D = Interest costs loan, t = corporate tax rate (Brealy, Myers, & Allen, 2020)
Working Capital	Working Capital = Current Assets – Current Liabilities (Brealy, Myers, & Allen, 2020)
Working Capital Costs	Costs of Working Capital = Working Capital Volume (Value) * Duration (Time) * Cost of Capital Rate (WACC) (Pfohl & Gomm, 2009) & Adapted by the author

References

Atrill, P., & McLaneyEddie. (2013). *Financial Accounting for Decision Makers.* Harlow (UK): Pearson .

Brealy, R. A., Myers, S. C., & Allen, F. (2020). *Principles of Corporate Finance.* New York (USA): McGrawHill.

Bryant, C., & Camerinelli, E. (2014). *Supply Chain Finance - European Market Guide.* Paris (F): European Banking Association (EBA).

De Boer, R., Steeman, M., & Van Bergen, M. (2015). *Supply Chain Finance, its Practical and Strategic Value.* Zwolle: Supply Chain Finance Community.

Dorsman, A. B. (2002). *Vlottend Financieel Management.* Amsterdam (NL): Elsevier.

Gieskens, J. H. (n.d.). *Strategic Working Capital Management.* Amstelveen: Alex van Groningen.

Harrison, A., & Van Hoek, R. (2011). *Logsitics Management & Strategy - Competing through the Supply Chain.* Harlow (UK): Prentince-Hall.

Hillier, D., Clacher, I., Ross, S., Westerfield, R., & Jordan, B. (2011). *Funademtals of Coroprate Finance.* Maidenhead (UK): McGraw-Hill.

Hollinger, F., & Gross, A. (2019, July 5). *Crop Receipts: A New Financing for Afirca.* New York (USA): IFC. Retrieved from IFC: https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/agribusiness/resources/crops+receipts

Jansen, J. H. (2021, August 10). O2C & P2P processes. *SCF processes*. Arnhem, Netherlands.

Kotler, P. (2000). *Marketing Management.* London (UK): Prentince-Hall.

Maskell, B., Baggeley, B., & Grasso, L. (2011). *Practical Leaan Accounting.* Boca Raton (USA): CRC Press.

Pfohl, H.-C., & Gomm, M. (2009). Supply chain finance: optimizing financial flows in supply chains. *Logistics Research*, 149-161.

Ploos van Amstel, R., & Farmer, D. (1991). *Effective Pipeline Management - How to manage integrated logistics.* Aldershot (UK): Gower Publishing Company.

Rotgerink, L. (2021). *Optimization O2C cycle SMEs with support of Fintech solutions.* Arnhem: Research Group Logistics & Alliances (HAN).

Schueffel, O. (2016). Taming the Beast: A Scientifc Definition of FinTech. *Journal of Innovation Management*, 32-54.

Slack, N., Brandon-Jones, A., & Johnston, R. (2016). *Operations Management.* Harlow (UK): Pearson.

Steeman, M. (2014). *The Power of Supply Chain Finance - How companies can apply collaborative finance models in their supply chain to mitigate risks and reduce costs.* Zwolle (NL): Windesheim University of Applied Sciences.

Templar, S., Hofmann, E., & Findlay, C. (2016). *Financing the End-to-End Supply Chain - A reference guide to Supply Chain Finance.* London (UK): Kogan Page.

Van Horne, J. C., & Wachowicz, J. M. (2001). *Fundamentals of Financial Management.* New Jersey (USA): Prentince Hall.

Van Weele, A. (2010). *Purchasing and Supply Chain Management.* Andover (UP): Cengage.

Veger, S. (2021). *Orter to Cash - Optimalisation of the order to cash process for SMEs.* Arnhem: Research Group of Loh=gistics & Alliances (HAN).

Zhao, L., & Huchzermeier, A. (2018). *Supply Chain Finance - Integrating Operations and Finance in Global Supply Chains.* Cham (CH): Springer International Publishing AG.